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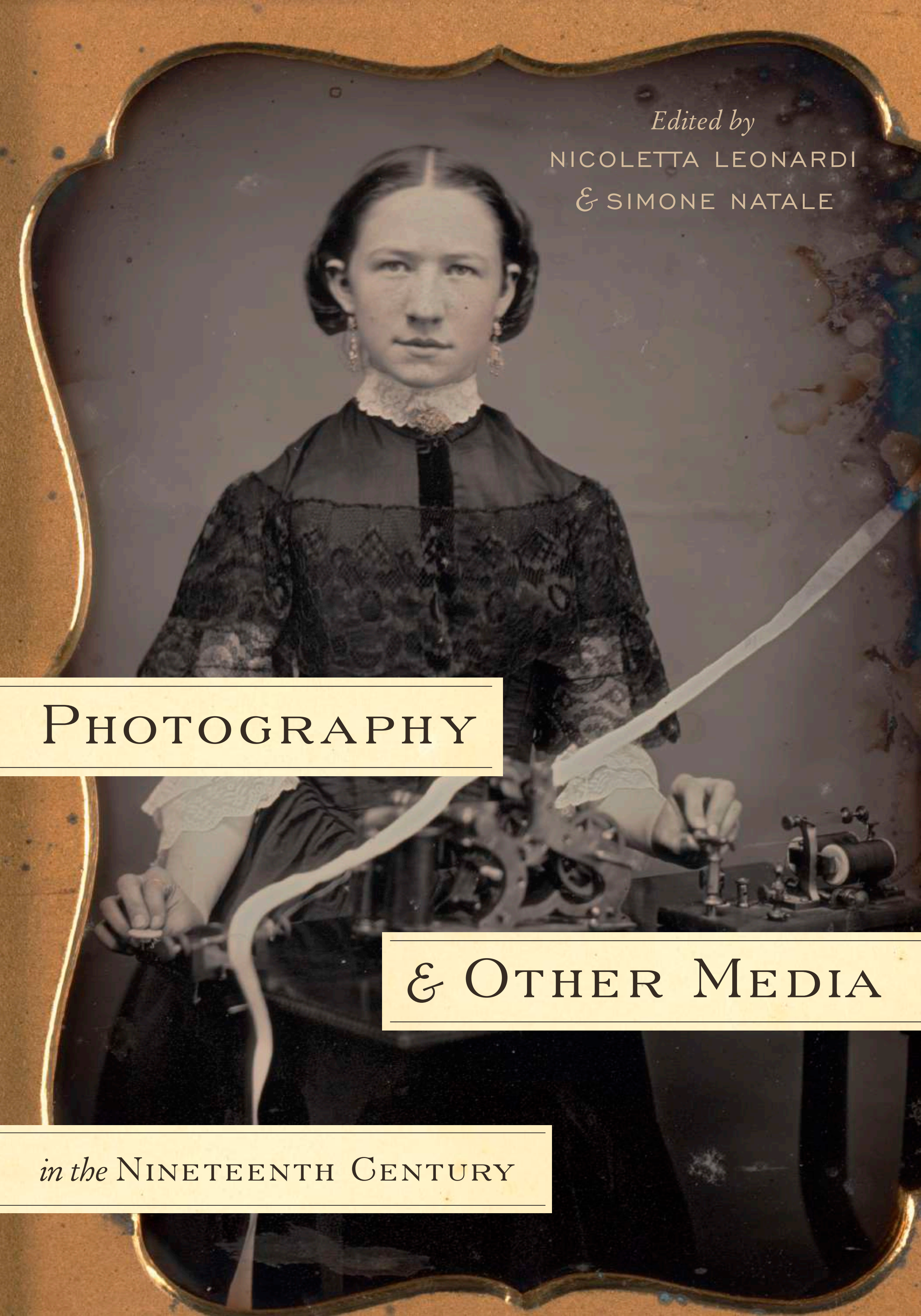
NICOLETTA LEONARDI & SIMONE NATALE



Photography & Other Media in the Nineteenth Century

PHOTOGRAPHY AND OTHER MEDIA

IN THE NINETEENTH CENTURY

Photography and Other Media in the Nineteenth Century

Edited by

Nicoletta Leonardi and Simone Natale

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Introduction

NICOLETTA LEONARDI AND SIMONE NATALE

In *Media and the American Mind*, a seminal work for media history published in 1982, Daniel J. Czitrom argued that the era of modern communication in the United States was inaugurated by the introduction of the telegraph in 1844.[1] In an attempt to explore "how media of communications have altered the American environment over the past century and a half," he focused on the advent of telegraphic technology, on the rise of the motion picture at the turn of the twentieth century, and on the development of American radio from wireless through broadcasting.[2] In a book whose time frame is 1844 to 1940, it is curious that almost no reference is made to photography, which is mentioned in passing only as a precondition for the appearance of another medium, cinema.

More than thirty years later, media history has become an established field of inquiry, supported by dedicated journals, associations, and conferences. Topics of interest to media historians include technologies as different as telegraphy, telephony, radio, television, film, sound recording, and digital media.[3] More broadly, a systemic approach has emerged within this discipline, which not only explores the relationship and intersections between different media but understands media as an integrated field of technologies, systems, and artifacts that can only be studied in its entirety.[4] Yet, in this context, photography has remained a neglected subject. An integrated approach to the history of photography and media is still much needed.

Conceived by two scholars who have different training and work in different disciplinary environments, art history and media studies, this book is built upon the assumption that a media history that fully and programmatically includes photography in its field of interest can make a substantial contribution to the discussion of the history of this medium. The word "other" in the volume's title, *Photography and Other Media in the Nineteenth Century*, is intended provocatively. It reflects the need to overcome artificial distinctions among "individual" media in favor of an integrated approach. In fact, the evidence and reflections collected here show that any medium is not just one thing but many, depending on its meanings and its uses, and demonstrate the need for further examination of photography's insertion into nineteenth-century

media systems and cultures, as well as for consideration of its links and exchanges with the many "other" media of the time. Such endeavors promise to be stimulating and productive challenges for scholars in different disciplines, such as media historians, historians of photography, art historians, historians of science, visual and material anthropologists, material culture scholars, and cultural geographers.

Written from a cross-disciplinary perspective and having as its main object of inquiry the relationship between photography and other media, this volume moves away from the notion of an autonomous history of photography. It points to the opportunity of decentering the dominant narratives of canonical and new histories of photography, in the attempt to build a more inclusive, diversified, and empirically oriented approach to the study of photographs and photographic apparatuses. While this volume focuses on Western cultures and places, the contributors offer insights into the potentials and promises of a perspective that, we hope, will continue to be explored in the future, as the study of photography in Western and non-Western societies develops from different methodological, theoretical, and disciplinary viewpoints.

The book covers a time frame that runs roughly from the invention of photography (an event that, like most inventions, can only be arbitrarily dated, in this case to the year 1839) until the end of the nineteenth century. The borders of this periodization are flexible, however, and occasional excursions before and after these time limits are included. While starting with the introduction of photography might be an obvious choice—although arguably a tricky one[5]—the end of the nineteenth century is only one of many potential end points for our time frame. Yet media historians have often considered media as "a nineteenth-century invention."[6] It is in this period that one might uncover the foundations of modern media culture—defined by Erkki Huhtamo as "a cultural condition where large numbers of people live under the constant influence of media."[7] If ongoing processes of technological and institutional convergence in the digital age have stimulated scholars of photography to look beyond the borders of their discipline, this book serves as a reminder of the fact that photography and other media have been converging and mingling for a long time—indeed, they have always done so.

Both the 1830s–1840s and the 1880s–1890s are periods marked by what media historians have defined as "explosive innovations" in the field of communication. Photography, rapid typographical techniques powered by steam engines, the telegraph, and the postage stamp were introduced between the 1830s and the 1840s. At the end of the nineteenth century, photography was entirely redefined due to the emergence of new forms of collective entertainment, such as the cinematograph, along with the appearance of fast newspaper-folding machines; the linotype; the typewriter; the gramophone; Edison's Kinetoscope; the telephone; radiotelegraphy; new literary genres; sports such as baseball, rugby, and football; modern advertising agencies; and new journalistic formulas.[8] Yet a history based on inventions and "new media" is only one among the many possible narratives through which we can make sense of media change throughout the nineteenth century and beyond. As Gaudreault and Marion rightly point out, media are born not just once but two or multiple times, as they are

constantly renovated on technological, cultural, social, and institutional levels.[9] The history of photography, in this regard, is a history of continuous change, a history that can be told only by combining, rather than contrasting, the ideas of rupture and continuity. Several contributions in this volume engage with the implications and the inescapable contradictions that result from the encounter between different media and practices. In pointing to the complex relationship between rupture and continuity, as well as between the "old" and the "new," they offer an escape from the otherwise limiting boundaries of historical narratives based on the idea of technological revolutions.

In the last few years, a rising corpus of works addressing nineteenth-century photography from a perspective complementary to our own has emerged, offering an important context and inspiration to us and other researchers who are working in this direction. Scholars have started to investigate photography's insertion within the broader context of media history, looking at the photographic medium in relationship with the history of communications, print culture, and the news.[10] Moreover, a range of theoretical and methodological explorations have pointed toward new directions and possibilities for conceiving the history of photography and, more broadly, the humanities and social sciences. Perhaps the most relevant of these explorations is the wide shift in the study of society and culture that has been labeled the "material turn."[11] Until relatively recently, the most prevalent tendency within the history of photography has been to consider images as an essentially visual phenomenon. The materiality of images has been predominantly conceived of as a mere support for their textual productivity, for their status as commodities, and for the analysis of their meanings as expressions of dominant ideologies projected onto them. The physical presence of photographs has been mostly overlooked or addressed in terms of connoisseurship and conservation. Furthermore, the history of photography has so far been constructed primarily as a history of images and authors. Cameras, supports, presentational forms, modes of distribution, and so forth have been largely overlooked. Contrary to such tendencies, the impact of the material turn has brought about the idea that a material perspective is essential to looking at the history of this medium. Starting in the late 1990s, scholars working within the history of photography have produced groundbreaking studies on the materiality of photographs.[12]

Issues of materiality have recently gained centrality in the fields of media history and media studies too. Authors such as Lisa Gitelman and Jonathan Sterne have deepened a perspective that addresses different media technologies as complex sociotechnological artifacts whose material nature influences the way they are used and actively interpreted by audiences and users.[13] In this regard, a theoretical framework that relies on the study of material culture promises to be a powerful tool for fostering dialogue and mutual exchange between scholars in the fields of media history and the history of photography. As Jennifer Roberts rightly emphasizes in her recent book on the movement of images in early America, mobility is a function of materiality: in other words, the material character of photographs is the condition that ensures the limits and reaches of their movement in space (as well as time).[14] Yet,

while Roberts posits a rigid distinction between new electrical media emerging since the nineteenth century, starting with the telegraph, and the "stubborn materiality" of analog pictures,[15] media scholars have shown that materiality is an element that shapes the movement of information in all media. Even digital media, in fact, move and exchange information through physical changes that possess their own materiality—although this might not be immediately evident to our senses.[16]

Within media studies, a powerful impetus for the study of material culture has been given by the work of authors working under the umbrella of media archaeology. Scholars such as Erkki Huhtamo, Jussi Parikka, and Wolfgang Ernst have pointed to the opportunity to combine the skills of the historian with those of the antiquarian, looking at the traces of media culture that can be located beyond written texts, in artifacts and objects to be researched and studied in archives as much as in antique shops, flea markets, private collections, and museums.[17] Although art historians are used to working in such environments and to looking at objects and artifacts as primary sources for their work, the example of media archaeology stimulates the addition of further depth to this enterprise. Huhtamo's recent monograph on the history of the moving panorama, for instance, is an example of how media archaeologists interrogate artifacts in terms of their visuality, materiality, technology, and context of use.[18] Artifacts—which, in the case of photography, include pictures but also and crucially cameras, photographic supports and materials, reagents, and so forth—can literally be brought back to life by the work of media archaeologists, who do not limit their gaze to the visual, cultural, or technological character of objects, but explore the broader implications of the material turn.

In recent years, moreover, increasing attention has been directed to photographic practices outside the professional and artistic realms, as well as to the productions of groups of individuals such as amateur photography clubs, commercial photographic studios, and researchers from the scientific community. The ways in which photographs circulate and change hands in different social and cultural circles, both within organizations and institutionalized groups and in private and informal contexts, has also come under scrutiny.[19] From this methodological standpoint, studying the work of amateurs can substantially contribute to integrated approaches to the history of photography and media. As indicated by Gil Pasternak, despite the fact that amateur photography has at times been addressed through the notion of the vernacular, this has never produced a decentering of dominant narratives about photographic history. As he puts it, "The canonical and new histories of photography have both paved orthodox courses to tell the story of photography, inserting it into different filing cabinets in a library that fails to record how vital photography has been to private experiences of modern everyday life and public experiences of the ordinary."[20] In this context, the opportunity for historians of photography to enter into dialogue with studies of the role of amateurship in the history of media such as wireless telegraphy and radio, as well as digital media, is a promising direction that has until now been very little explored.

Another fruitful context of dialogue for scholars interested in the history of photography is the tradition, heralded by Bourdieu's influential volume on the topic,[21] which focuses on the use and impact of photography from a sociological standpoint. Media history's transdisciplinary perspective, which combines historical methodologies with sociological perspectives and approaches, offers a powerful encouragement to pursue and further develop this focus. Media scholars interested in inquiring how people integrate different media (including photography) into their experience and everyday life have recently shown how qualitative methods may provide key insights into photography's social and cultural presence.[22] Historical scholarship can take up this same preoccupation in the attempt to recover and animate the social life of the photographic medium, exploring how it was used and integrated into the experience of people in different times and places. In this book's opening chapter, pioneering media archaeologist Erkki Huhtamo observes that histories of photography tend to emphasize the medium's achievement from aesthetic, technological, and cultural points of view. As a consequence, sources that display the problems and difficulties people encounter with photography may be disregarded. Just as ethnographers need all their attention to perceive the full complexities and nuances of what informants and sources tell them, historians need a fresh and receptive mind frame to enter into the fabric of textual, visual, and material sources through which they contribute to building our understandings of the past.

While looking at the drastic changes in the technologies and practices of communication that characterized the nineteenth century—such as the introduction of electric telegraphy and the development of the railway and the postal system—in relationship to and in conjunction with the contemporary emergence of photography, the essays collected in this volume offer theoretical explorations that address the history of photography from fresh viewpoints. The volume is organized in three parts. This structure helps highlight the significance of three processes—communication, reproduction, and dissemination—through which photography is inserted within a broader system of media and communications.

Part 1, "The Emergence of Modern Communications," looks at the emergence and early history of photography as embedded in broader changes concerning the history of communications.

The first chapter, "*Elephans Photographicus*: Media Archaeology and the History of Photography" by Erkki Huhtamo, charts the ways in which media archaeology could be made a productive tool for questioning and broadening our understanding of photography, its cultural contexts, and its interrelationships with other media. Through a discussion of the historiography of photography, Huhtamo argues that an archaeology of photography should be *media* archaeology: instead of dealing with photography in isolation from other media practices, it should embrace the connections it has with them on all possible levels. Huhtamo shows how discussing photographs as symptomatic pointers to underlying developments should be part of the endeavor, but never separated from the contexts—from material to

discursive—that informed their becoming and within which they radiate impulses to other media forms.

In chapter 2, "A Mirror with Wings: Photography and the New Era of Communications," Simone Natale questions how and to what extent photography participated in the transformations of the ways communication was conceived, administered, and used in the mid-nineteenth-century United States. Examining aspects of the medium's reception of the period, he shows that this was related to improvements in communication and transportation technologies and that photography was conceived, from the very beginning, as a medium of communication in the strictest sense of this term: a tool for putting images in movement in order to be carried, marketed, and transported.

The contemporaneous introduction of photographic techniques and cheap postal services in the Western world is at the base of chapter 3, "The Traveling Daguerreotype: Early Photography and the U.S. Postal System," in which David Henkin points to the fact that, while historians of art have focused on the relationship between the spread of photography and other techniques and media of image reproduction, the value and use of daguerreotypes, and especially daguerreotype portraits, depended heavily on new and evolving methods of circulation and transmission as well. Taking the example of the United States, Henkin looks at how technologically unspectacular but nonetheless momentous shifts in how Americans used the mail in the middle of the nineteenth century enhanced and focused the appeal of the personal photographic portrait.

The extent to which telegraphy and photography, both of which promised to transcend time and space, were intertwined at crucial junctures of their histories is at the center of chapter 4, "The Telegraph of the Past: Nadar and the Time of Photography." Richard Taws argues that, in much of the discourse on telegraphy's relationship to both contemporaneous and "new" media, telegraphy resonates as a technology grounded in a turnaway from representation, a marker of the modern world's gradual drift toward elusive, immaterial, virtual presence. Yet the telegraphs with which Nadar punctuated his writings on photography operated by visual means: Chappe's system based on a network of semaphoric relays and Caselli's pantelegraph, an early form of fax machine. Taws looks at the afterlife of optical telegraphy to suggest that visuality continued to inflect the subject of telegraphy in France after the 1850s, providing a means of conceptualizing the historical meaning of diverse media.

In chapter 5, "With Eyes of Flesh and Glass Eyes: Railroad Image-Objects and Fantasies of Human-Machine Hybridizations in the Mid-Nineteenth-Century United States," Nicoletta Leonardi offers an analysis of the visual economy of railroad landscape representation and reception. By taking as objects of inquiry paintings, photographs, and prints commissioned by railroad companies and by focusing on the processes of production, circulation, and consumption of serialized image-objects, Leonardi demonstrates how, besides contemplating the machine in a pastoral setting, another aspect of landscape culture was that of looking at nature *through* machines: the train coach, the photographic camera. This landscape mode offered the viewer the possibility of moving through the panoramic landscape by way of a series of replicable

and repeatable visual experiences in which the camera, the train, and the observer's eye appeared as bound together in a single entity: a viewing subject resulting from a fantasy of hybridization of the human and the machine.

The extent to which the early history of photography was bound up with the nascent photographic press (through which technical innovations widely circulated) and the ways in which photographs were reproduced through other visual media are discussed in part 2, "Technologies of Reproduction."

In chapter 6, "Peer Production in the Age of Collodion: The Bromide Patent and the Photographic Press, 1854–1868," Lynn Berger argues that the photographic press encouraged and facilitated knowledge sharing and collaboration among the nascent photographic community in the United States, fostering a prolonged debate about the nature of intellectual property and enabling what we might today recognize as "peer production." Within this context, the importance of openness, sharing, transparency, and fraternity was stressed over and over again, and patents, while deemed unavoidable at times, were regarded with caution.

In chapter 7, "Two or Three Things Photography Did to Painting," Jan von Brevern discusses how photography, from about 1850 onwards, was expected to become a new common language and, as such, to transform the entire system of art production and reception. Looking at photographic reproductions of visual media, Brevern argues that in mid-nineteenth-century France, painters (such as Delacroix) and art critics (such as Théophile Gautier) were not interested in whether photography itself was art or not so much as in how it would alter traditional arts, such as painting. Brevern argues that the reason photography was expected to have a great impact on art was not because it produced exact reproductions, but because it was considered, compared to manual reproduction media, a medium without style.

The relationship between photography and older graphic techniques of picture making is the focus of chapter 8, "Uniqueness Multiplied: The Daguerreotype and the Visual Economy of the Graphic Arts," in which Steffen Siegel discusses how, shortly after the introduction of the new medium, reflecting about the use and value of photographic procedures went through their insertion into a horizon of comparison between different media. Through an analysis of Lerebours's *Excursions daguerriennes*, a number of subscription books containing daguerreotype views of the world's monuments redrawn by hand as aquatint engravings, Siegel shows that the wide spectrum of older graphic media, such as engraving, etching, and lithography, created and stimulated discussions about the daguerreotype's multiplication. Thus, the essential uniqueness of each single daguerreotype plate was approached under the conditions of its ability to be multiplied and taken as a point of departure for a culture of the copy aimed at producing perfect simulacra.

In chapter 9, "Photographs in Text: The Reproduction of Photographs in Nineteenth-Century Scientific Communication," Geoffrey Belknap investigates the value of the reproduced photographic image when placed in a variety of media contexts within the particular genre of scientific communication. Belknap examines the

occurrence of photographic reproductions within three sites of scientific communication: scientific periodicals; books that popularize and communicate scientific evidence; and the correspondence of two well-known nineteenth-century scientists, Charles Darwin and John Tyndall. Rather than being primarily representational, photographs in such contexts become technological objects situated in the shifting contexts of the situation within the text. How a photograph was used and what it was used to say, therefore, may change depending upon its form of reproduction within different media genres.

Part 3, "Popular Cultures," addresses the advent and development of photographic techniques as part of a broader media culture within which technologies and cultural forms such as the mass-consumed novel, sound recording, and cinema were offering new ways to access and distribute different kinds of contents.

In chapter 10, "In the Time of Balzac: The Daguerreotype and the Discovery/Invention of Society," Peppino Ortoleva looks at the advent of the daguerreotype and the birth of serialized fiction in the 1830s and 1840s as a case of systemic interdependence. Great narrators such as Balzac and Hawthorne depicted a social system characterized by the self-construction of individuals within the boundaries of social rules and hierarchies. Their portrait of society was deeply connected to the everyday storytelling of popular newspapers (which often hosted the novels themselves) as well as to photography. Following the thread of contradictions and complexities characterizing Balzac's approach to photography, Ortoleva sheds light on the fantastic and even supernatural expectations and representations that the daguerreotype inspired and that accompanied and counteracted photography's alleged "objectivity" in the nineteenth century.

In chapter 11, "Sound Photography," Anthony Enns discusses how, beginning in the late eighteenth century, scientists developed various graphic methods of visualizing sounds and points to the fact that photography was among the earliest devices used to record sounds. Like phonography, sound photography produced indexical tracings of the phenomena it served to represent, which effectively allowed sounds to record themselves. Unlike phonography, however, sound photography was seen as a natural extension of the graphic method, which facilitated the comparison and classification of waveforms by converting acoustic phenomena into quantifiable and analyzable information. Enns argues that the practice of sound photography represents a largely forgotten moment in the history of scientific attempts to translate acoustic phenomena into graphic signs for the purpose of making sounds legible as writing.

In chapter 12, "Photography, Cinema, and Perceptual Realism in the Nineteenth Century," Kim Timby explores how in the nineteenth century photography and cinematography were tied up in the same web of collective associations that surrounded visual representation. Since the invention of the photographic image, there was a desire to imbue it with aspects of human visual perception deemed missing, so as to increase its "perceptual realism." Timby argues that the experience of cinematography,

which became popular in 1895, both answered to and raised expectations of perceptual realism in photography. For the public, it constituted an extension of photography in that the new images were simply moving photographs. This spectacular and definitive-seeming solution to movement was taken as evidence that technological progress was leading toward a complete mastery of representation of the world as we see it.

Through a series of essays published over the course of several years, André Gaudreault and Philippe Marion have developed a particular approach to the genealogy of media, which they have described as the "double-birth" model. In chapter 13, "The Double-Birth Model Tested Against Photography," they employ the case of photography's early history to substantiate the model's claim that a medium does not impose itself as an autonomous medium, one worthy of the name, until it has rendered its own opacity tangible and credible; in other words, until it has defined its own way of re-presenting, expressing, and communicating the world. Employing a comparative approach that relies on examples from the history of cinema and of other media, the authors argue that photography's "second birth," that of the medium's institutionalization, consisted in fixing for a period of time the federation of the different cultural series that make up photography.

Finally, in the afterword, historian of photography Geoffrey Batchen and media historian Lisa Gitelman discuss how the study of photography can contribute to an integrated history of media and how media history can contribute to a better understanding of the history of photographic practices. Coming from two authors who have been extremely influential in their respective disciplinary fields, their dialogue reads as a powerful incitement for scholars who move at and across the intersection between these fields.

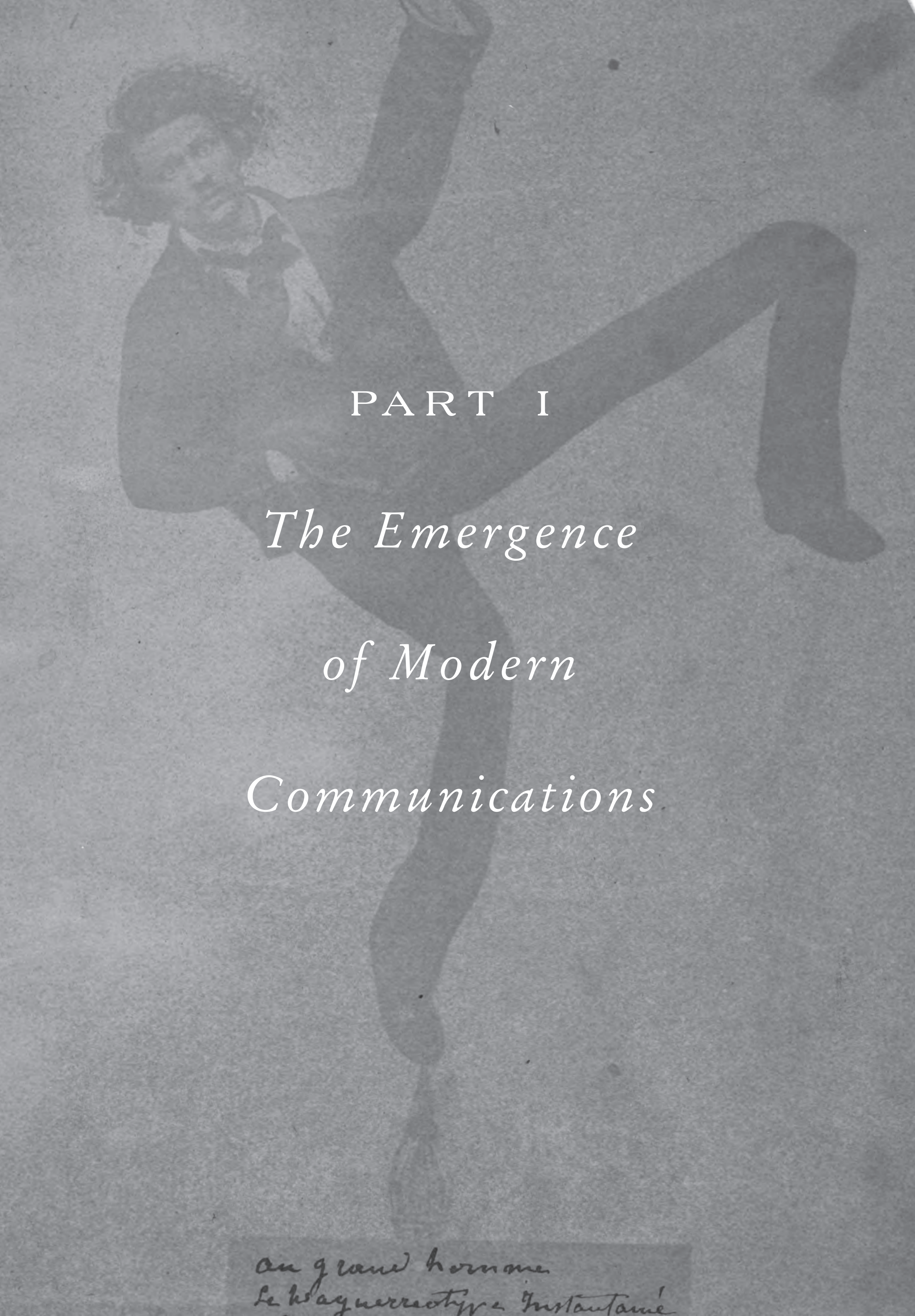
As Batchen observes, photographic history—indeed, any form of history—is a creative practice. This book is built upon the conviction that it is beyond their immediate and more familiar horizons that historians of photography and media will find new ideas and insights to feed such creativity. It should be read first and foremost as a call for further inquiries about the complex connections between photography and other media since the nineteenth century. There is much work yet to do in this context, and readers will surely find many omissions in the topics and scope of the chapters. It is our hope, however, that this book will bring some original visions and perspectives to the horizon, inspiring novel questions and ideas that will further challenge medium-specific histories and contributing to a better understanding of both mediality and intermediality in the nineteenth century.

Notes

1. Czitrom, *Media and the American Mind.*
2. Ibid., xi.
3. For theoretical and methodological discussions regarding the scope and aim of media and communications history, see, among others, Poster, "Manifesto for a History of the Media"; Nerone, "The Future of Communication History"; Brügger,

"Theoretical Reflections on Media and Media History"; Balbi, "Una storia della storia dei media."

4. Gitelman, *Always Already New*; Bolter and Grusin, *Remediation*; Stöber, "What Media Evolution Is."
5. An exploration into the history of photography may in fact start before the invention or introduction of this medium, as shown for instance in Batchen, *Burning with Desire*. Moreover, as discussed in chapter 13 by André Gaudreault and Philippe Marion, the very definition of what we mean by "invention" or "introduction" of a medium is problematic.
6. Colligan and Linley, *Media, Technology, and Literature*, 1.
7. Huhtamo, *Illusions in Motion*, 364.
8. Flichy, *Dynamics of Modern Communication*; Ortoleva, *Mediastoria*; Otis, *Networking*.
9. Gaudreault and Marion, "A Medium Is Always Born Twice." See also chapter 13 of this book, as well as Stöber, "What Media Evolution Is."
10. See, among others, Hill and Schwartz, *Getting the Picture*; Dinius, *The Camera and the Press*; Batchen, "Electricity Made Visible"; Rudd, "Public Faces"; Natale, "Photography and Communication Media"; Uricchio, "Ways of Seeing."
11. Within art history, a pioneering contribution toward the understanding of the importance of the materiality of art objects has come from the influential work of Michael Baxandall. See in particular Baxandall, *Painting and Experience in Fifteenth-Century Italy*; see also Osborne and Tanner, *Art's Agency and Art History*. Within visual and cultural anthropology and in cultural studies, scholars such as Arjun Appadurai, Igor Kopytoff, and Daniel Miller, among others, have shown that objects, like persons, have social lives and are involved in a continuous process of social transformation that involves changes in their meaning and use. Appadurai, *The Social Life of Things*; Kopytoff, "The Cultural Biography of Things"; Miller, *Stuff*; Miller, *Material Culture and Mass Consumption*; Gell, *Art and Agency*.
12. See, among others, Poole, *Vision, Race, and Modernity*; Edwards, "Material Beings"; Pinney and Peterson, *Photography's Other Histories*; Edwards and Hart, *Photography Objects Histories*; Edwards, *Raw Histories*; Roberts, *Transporting Visions*.
13. Gitelman, *Scripts, Grooves, and Writing Machines*; Sterne, *The Audible Past*.
14. Roberts, *Transporting Visions*. On materiality as a condition for movement in time, see Yablon, "Posing for Posterity."
15. Roberts, *Transporting Visions*, 6.
16. Kirschenbaum, *Mechanisms*.
17. Huhtamo, *Illusions in Motion*; Parikka, *A Geology of Media*; Ernst, *Digital Memory*. See also Natale, "The Historian and the Antiquarian"; Parikka, *What Is Media Archaeology?*; Huhtamo and Parikka, *Media Archaeology*.
18. Huhtamo, *Illusions in Motion*.
19. For a study of the role of groups of individuals in the history of photography see Edwards, *The Camera as Historian*.
20. Pasternak, "Photographic Histories, Actualities, Potentialities."
21. Bourdieu, *Photography: A Middle-Brow Art*.
22. Keightley and Pickering, *Photography, Music and Memory*.



PART I

The Emergence of Modern Communications

{ 1.}

Elephans Photographicus

Media Archaeology and the History of Photography

ERKKI HUHTAMO

Oh, Clarissa, look at that big machine. One would think that a huge eye is looking at us.
—Cartoon ascribed to Edmond de Beaumont, *Charivari*, July 27, 1859

The history of photography, too, has its hidden, undiscussed areas which lie below the threshold of the textbook.
—Bill Jay, *Cyanide and Spirits*, 12

Introduction: Revisi[ti]ng the History of Photography

The other day, while browsing the Internet, I encountered a "Samuel L. Jackson image macro meme" that caught my attention. It stated, "Say 'media archaeology' just one more time" over a picture of a gun-toting hitman pointing at the viewer.[1] Indeed: media archaeology has gained so much attention recently that it may have exceeded the tolerance limits of some observers.[2] It has been applied to a wide variety of topics, and the area is broadening. There is no shared consensus about its goals and methods, but most of its practitioners would agree that it is about (re)discovering aspects of media history that have been neglected, misrepresented, or suppressed. Their motivations vary from methodological concerns and excitement about new source material to frustrations with sloppy research by earlier scholars and ire about ideological biases. Most of them question linear and deterministic narratives about "great men" and inventions that became "winners," focusing on marginalized phenomena as potential

for revising existing histories.[3] Media archaeology is new historicist in the sense that it does not believe we can ever know "how things truly were." The observer's subjectivity can be controlled but never fully eliminated. Media archaeology is dialogical: it puts different phenomena and moments in time (including the moment of writing) into contact, urging them to explain each other.

Media archaeology has not yet had a broad impact on photography scholarship. Still, a handful of researchers have moved in this direction, without identifying their work as "media archaeological." There are no clear guidelines for how media archaeology could be made productive as a tool for investigating photography. The purpose of this essay is to initiate a process of reflection on this issue. Any such endeavor must begin by assessing the work done so far. Because the literature on the history of photography is huge, that can only be done selectively. Some important contributions may therefore have been inadvertently omitted from the following review. Whatever this essay may achieve, it should not be expected to offer any definitive methodological guidelines. Rather, it should be taken as a series of test excavations—tentative efforts to identify sites where media archaeology may come to fruition as a way of questioning and broadening our understanding of photography, its cultural contexts, and its interrelationships with other media.

The historiography of photography has been in upheaval since the 1980s.[4] The standard histories by Beaumont Newhall and Helmut and Alison Gernsheim have been deemed biased because of their almost exclusive focus on photography as an art.[5] Photography became segregated from and in a sense transfigured above the everyday life that it so often depicted. As a case in point, the Gernsheims' *A Concise History of Photography*, published in 1965, must have given countless general readers their idea of what the history of photography was all about. It is divided into two main sections, "The Technical Evolution of Photography" and "The Artistic Achievements of Photography."[6] The first covers less than 50 pages, including a few on the prehistory of photography, while the second is nearly 250 pages long.

Although the Gernsheims discuss in passing commercial forms like carte de visite photography and pay some attention to issues such as documentary photography, their overall vision is an aesthetic one. Symptomatically, the horrors of the Second World War are represented by Cecil Beaton's highly formalistic *Remains of a Tank in the Libyan Desert* (1942), where the traces of destruction are interpreted by the Gernsheims as a kind of abstract sculpture "transfigured" from its original context.[7] Although stereoscopic photography is briefly discussed in the first section, it has nearly disappeared from the second. No examples of amateur snapshot photography, which would without a doubt have been the most familiar form for the reader, have been included. Newhall's and the Gernsheims' efforts made a case for the admission of photography into the pantheon of the legitimate arts, building a bridge with the isolated efforts begun in the Victorian era by photographers like Julia Margaret Cameron and Henry Peach Robinson and carried forward by figures like Alfred Stieglitz.[8] The trajectory was specific and goal-oriented; the exclusions were programmatic rather than accidental.

During the past three decades such an approach has been found limited and elitist.[9] For the general reader, Newhall's and the Gernsheims' books may seem exhaustive treatments of the history of photography, but a critical scholar will soon discover that they are in fact highly selective. They are essentially histories of carefully selected photographs rather than of photography as a medium and overarching cultural phenomenon. This becomes clear if we compare them with books by European pioneers, the Austrian Josef Maria Eder's *History of Photography* (1904; 1932 fourth edition translated into English in 1945) and the German Erich Stenger's *The History of Photography: Its Relation to Civilization and Practice* (1938, translated in 1939).[10]

The issue of photography as an art form plays a peripheral role in both Eder's and Stenger's works, while photography's technical and industrial development as well as its branching out into numerous applications occupy the center stage. Eder spends nearly two hundred pages exploring phenomena that prepared the ground for photography before he gets to Niépce, Daguerre, and Fox Talbot. Both Eder and Stenger discuss many uses of photography that receive little or no attention in Newhall's and the Gernsheims' books. These include, to select just a few examples, balloon photography, photogrammetry, stereoscopic photography, photoceramics, microphotography, and cinematography. Where Eder's work is technically oriented throughout, the final third of Stenger's work pays attention to "photography as a profession and a hobby in civilization and as an economic asset." This section lays a foundation for discussing photography's cultural repercussions, as it deals with injuries suffered by professional photographers, the beginnings of amateur photography, and photography's discursive manifestations in literature, poetry, plays, and caricatures.

Stenger's work, which has rarely been mentioned in studies of photography, contains ingredients of what Hans J. Scheurer called in 1987 the "cultural and media history of photography."[11] Mary Warner Marien takes on a somewhat similar task in *Photography: A Cultural History* (2002).[12] Although her book discusses photography as an art form, that is not its exclusive focus. The discussions are interspersed with other concerns. Marien spends little time explicating her method but says she has "tried to survey photography's history in such a way that readers can gauge the medium's manifold developments, and appreciate the historical and cultural contexts in which photographers lived and worked."[13] She makes a case for the "cross-disciplinary" nature of photography, reminding the reader that "time, place, and circumstance involve knowing whose time, what place, and what was happening in and outside the picture."[14]

In spite of the wealth of contextual material it contains, the main focus of Marien's book is understanding individual photographs both by direct observation and by placing them within settings that informed their creation. In spite of its massive proportions, the work is not all-embracing. Although pornography was produced almost immediately after the introduction of the medium, the word appears only once in the index, and the reference is brief. Two mildly erotic photographs are reproduced, and nothing at all is said about the blossoming market for hardcore "money shots"

in the Victorian era. Spirit photography does not make it to the index at all. Only a few lines, supported by one photograph, are dedicated to the topic.[15] For Bill Jay, to whom we will return, this would have been a lacuna: "The fact remains: if we were to compile a list of the topics which most energetically engaged the attention of early photographers, then spirit photography would be near the top."[16] Perhaps because it is intended as a textbook, the tone of Marien's work—although toned down—is laudatory. Cameras captured gruesome scenes, but photography itself does not have any dark shadows—or if it has, they have been glossed over. Photography remains overall a positive and constructive thing.

Older historiographical schemata may persist underneath seemingly revisionist surfaces. This is the conclusion Cecilia Strandroth draws about Michel Frizot's massive *A New History of Photography*, originally published in French in 1994.[17] Although the contributors no longer approach photography exclusively as an art form, Strandroth finds "essentialist" and "prescriptive" arguments, claiming that the book has not shed "the modernist logic which is the foundation of Newhall's work."[18] It promotes "the ideal of the media specific: the idea that each medium has its own specific means of expression, which should be purified and cultivated while influences from other media should be repudiated and cast away."[19] In a contrary spirit, Strandroth calls for a "history which considers not only the evolution of a specifically photographic aesthetic but the influence on photography from the greater visual culture." Her plea for a truly new history of photography sounds like a distress call to the media archaeologist: "I wish for a history which does not turn into a celebration of the medium, which does not turn the photograph into an object of desire: a history which does not confirm the medium but resists it, which does not give in to its allures but questions them, investigates them and subverts them."[20]

Prolegomena to a Media Archaeology of Photography

To begin assembling the building blocks for the still-hypothetical media archaeology of photography, we must first search for its "primitives" within the photographic scholarship itself. This leads us to theorists like John Tagg and Geoffrey Batchen. Influenced by Foucault and Louis Althusser, Tagg attempted to lay the foundations of a materialist history of photography in *The Burden of Representation* (1988). He writes provocatively, "The photograph is not a magical 'emanation' but a material product of a material apparatus set to work in specific contexts, by specific forces, for more or less defined purposes. It requires, therefore, not an alchemy but a history."[21] One of Tagg's formulations should qualify as a dictum for media archaeologists: "What is real is not just the material item but also the discursive system of which the image it bears is part."[22] Tagg's book investigates the uses of photography as a means of surveillance, an official record, and a legal document, as well as other aspects of the history of photography that until then had been left to the sidelines. It also suggests

revisionist readings of documentary slum photography and the visual rhetoric of New Deal reformism in the United States. Dismissing idealistic approaches, Tagg made a brave attempt to release photography from the isolation to which it had been relegated by aesthetic and phenomenological accounts and to reposition it within networks of ideological and discursive settings.

Mapping an emerging desire that had anticipated the invention of photography, in his *Burning with Desire* (1997) Batchen criticized postmodern theorists for maintaining "an entirely instrumental view of photography"—in other words, for treating it as "a mere vehicle for the transfer of power from one place to another."[23] According to his interpretation, Tagg was doing exactly that—separating photography from power and setting up "a logic of priority in which power always precedes photography, having its ultimate source in the apparatuses of state."[24] Batchen called for an approach that would "allow us to speak not just of 'photography and power' but of 'photography *as* power'" (emphasis in original).[25] This complex issue is relevant for both the history of photography and media archaeology. Is it enough to read photographs symptomatically as more or less passive carriers of ideological operations? Or can they also be treated as (semi)autonomous cultural agents, capable of producing discourse emanating from the photographic ontology, ostensibly through mergers and clashes with other media and societal settings? We should also ask, What is the relationship between the general and the singular—photographs as power and (a) photograph as power?

We will return to this issue later, but let it be stated here that there can be no media archaeology of "pure" photography or "pure" photograph that is supposed to be graspable through idiosyncratic acts of observation and interpretation. Anyone—including the observer "Roland Barthes" in *Camera Lucida*—can only experience photographs by reading meanings in them on the basis of acquired codes. The interpretations may be poetic, emotional, or intellectual, but they cannot be generalized. For the media archaeologist, such operations provide at best a starting point, a symptomatic moment, which may or may not prove pregnant with historical insights. Whether photographs have or do not have intrinsic power, this power is only activated and detected within ideologically, economically, and socially coded contexts. The testimony of a photograph must be tested by rigorous contextualization on multiple cultural levels, from the material to the discursive, and assumptions about the cultural independence of photography as a medium must be abandoned. It could be claimed that medium specificity is just a construct imposed on reality by observers, including critics. A media archaeologist considers preexisting fences, definitions, and "essences" potentially as myths that must be questioned and—more often than not—torn apart.

Media archaeology should not neglect the testimonies of the photographs themselves, but it can profit from research that prioritizes context over the photographic image. Heinz K. and Bridget A. Henisch identified their *The Photographic Experience* as a social anthropology of photography, "an exploration of the varied relationships between photography and painting, book publishing, journalism, war, humor, and the ways without number in which photography has served as a mode of expression for

sentiments public and private."[26] As a consequence, the book circles *around*, *between*, and *behind* photographs instead of being *about* them. Hardly any effort is made to analyze specific photographs, whereas ample attention is paid to their "framing," both materially and metaphorically.[27]

The writer who came closest to formulating a program for a media archaeology of photography (without ever using these words) was Bill Jay (1940–2009), a British photographer, magazine editor, and educator who taught for decades at Arizona State University. Jay was a quirky and combative figure and obviously reveled in the role of a misfit. As a former student of Beaumont Newhall and Van Deren Coke, he was an advocate of the art of photography, but his numerous writings, especially those collected in *Cyanide and Spirits: An Inside-Out View of Early Photography* (1991), undermined, page by page, accepted truths about photography.[28] Jay's texts have been neglected by scholars, which in a way enhances their value as a fresh discovery and excavation zone for media archaeologists.[29] Jay proposed an approach that he called "the inside-out view of history."[30] He characterized it as a way of "understanding the past in its own context, for its own sake, without reference to now."[31] This resonates with established areas like mental history and microhistory but not perfectly well with media archaeology, which emphasizes the need to consider as well the "now" in the dialogues with the past it unleashes. Jay was not a theorist, but he managed to tear open seams that had been sealed, hidden, or ignored by the historians of photography.

Jay explained his approach in the introduction to *Some Rollicking Bull: Light Verse, and Worse, on Victorian Photography*, a collection of documents he edited: "One of my particular (and, some would say, peculiar) pleasures is to read 19th century photographic periodicals, page by page, volume by volume. Copying with gay abandon, I feed my files with hundreds of items on personalities, processes and photographic topics. I gain a sense of the issues which actually engaged the minds of the Victorian cameramen—which were very different from the issues with which historians have told us they concerned themselves."[32] As a case in point, Jay pointed out that the Victorians' "whacky sense of humour" constituted a "striking difference between the actuality and present perception."[33] The "light verse, puns, riddles and jokes, as well as bizarre tales and weird and wonderful events," he had discovered formed a contrast with the received idea about the solemn and moral quality of the Victorian era, including its photographic culture.[34] Jay would have found support for his argument had he begun studying the booming illicit pornographic literature of the era, not to mention the proliferation of "dirty" photographs.[35]

Some of Jay's case studies may seem little more than retellings of anecdotes from the annals of photography. In the introduction to *Cyanide and Spirits*—a work that has been a personal inspiration to me since 1994—the author staunchly denies that "the contents of the following pages constitute photographic 'ephemera' (of short and transient interest). If standard histories provide a useful skeleton, then these topics flesh out the chronology, giving it a human presence, and an individualised, personalised identity."[36] The title of the book singles out two emphases: "Cyanide" refers

to phenomena that had to do with the material aspects of photography, such as the effects of poisonous chemicals and the studio explosions that killed photographers, as well as "improbable surfaces" on which photographs were printed, including fishes, fruit, and human skin.[37] "Spirits" refers not only to spirit photography but also to discursive "echoes," such as the belief that images are fixed on a dying person's retina or that the direction of the wind has an impact on exposure times. Jay also evokes fantasies inspired by studio practices, such as the necessity of immobilizing the sitters or artificially improving their looks.

Particularly inspiring are the concluding chapters, "The Camera Fiend" and "Hat Cameras."[38] The former explores early attitudes toward amateur photography. Jay concentrates on the animosity toward photography in public spaces. The early snapshot craze was considered a menace and led to protests and debates. Photography was characterized as a "peril of modern existence." *Punch* published a cartoon titled "The Amateur Photographic Pest," showing helpless people being harassed by hordes of photographers.[39] Poems extolled the breaking of intruders' cameras, and laws to protect privacy were requested. Jay's version is diametrically opposed to the one that can be read from histories of amateur photography or even from Marien's *Photography: A Cultural History*. His findings open up fresh vistas for further research. Cartoons depicted not only male photographers peeping at pretty girls but also female camera club members stalking men in embarrassing and even life-threatening situations. Instead of running for rescue, the ladies happily concentrated on immortalizing the males in peril in "perfect shots." Such role reversals may well point to an unwritten chapter of women's history, although the relationship between discursive manifestations and actual social practices should first be figured out.[40] Such issues are also worth connecting with the debates ignited by the introduction of mobile phone cameras.[41]

When it comes to the final chapter, cameras disguised as bags, hats, or walking canes were both an extreme manifestation of the obsession to photograph anyone anywhere and a protective reaction against those who were upset by the violations of privacy.[42] Devices like the "anti-camera shade" (a kind of protective full-body umbrella) were proposed by satirical cartoonists.[43] Jay's analysis contains seeds for a critique of discursive practices within various cultural and mediatic frameworks. He leads us to ponder why the laudatory version of the history of amateur photography has turned into the canonical narrative. Indeed, according to a widely disseminated myth, amateur photography has no dark shadows, contradictions, or internal fault lines; it is and has always been a creative pastime everyone loves and no one questions. There is little doubt that the Eastman Kodak Company, with its huge resources, has been complicit in this. It has not only financed its own handsome history book that extols its achievements but also funded research on popular photography.[44] One searches in vain in the books written by Brian Coe and others for references to the kinds of discontents Jay writes about.[45]

In a companion volume to *Cyanide and Spirits*, titled *Occam's Razor: An Outside-In View of Contemporary Photography* (1992),[46] Jay, without engaging in a

detailed analysis or even mentioning names, presents a blunt assessment of the state of photographic writing, particularly of the type he calls "pseudo-intellectual."[47] Refusing the stance of an "insider," Jay makes a case for an "outside-in view" of photography, professing the idea that photographs cannot and should not be separated from the cultural milieus that surround them. Photography "is not an end result but a *means*."[48]

Occam's Razor contains formulations that qualify as house rules for would-be media archaeologists of photography. Jay asserts that a photograph can provoke "mental and emotional meanderings into geography, psychology, politics, biography, sociology, popular culture, art history, science, morality and a myriad of other connected fields until each picture seem[s] to resonate with the whole of human history."[49] Rather than "an objective list of names, dates, processes and other irrelevant facts," the history of photography is "a palpable, pertinent, recognizable force for enriching the whole of life, not merely the aspect called photography. History is the story of individuals' dreams, their aspirations, their disillusionments, their cries of protest at being human, their challenges to fate in the face of defeat, and their shouts of joy in moments of victory over self and nature."[50] Such an expansive view calls for the abandonment of the medium-specific isolationism that still characterizes much writing on photography and other media forms as well.

Last but not least, Jay attacks "great man" history: "The point is that the majority of individuals working in any area, at any period in history, were then, and remain, nameless, faceless and unknown, and that is as it should be. *But* their activities, as a whole, form an important and integral part of any medium and cannot be ignored" (emphasis in original).[51] An example follows: "The cheap portrait photographers, working out of backstreet attic dens, are rarely mentioned in the histories of photography yet their attitudes to the medium, and their style of working, were far more common than those by the rich and famous, working out of elegant studios in the fashionable areas of the city."[52] Jay was abreast of the times. His idea recalls what Siegfried Giedion called "anonymous history" in his classic *Mechanization Takes Command*, but it also lines up with microhistory—especially the work of Carlo Ginzburg—and the histories of popular culture and everyday life.[53] Alain Corbin's magisterial *The Life of an Unknown*, although not about media culture, is a kind of achievement that Jay's rough, hastily scribbled, and occasionally sloppy, yet always inspiring, writings might have aspired to.[54]

Whatever one thinks about Jay's work, he pointed out something important: researching only the "sunny side" of photographic culture is not enough and can be misleading. The history of photography should not be configured as an encomium of its achievements—it is equally important to pay attention to failures, embarrassments, controversies, injustices, and outright catastrophes. Like Heinz K. and Bridget A. Henisch and Rolf A. Krauss (and decades earlier Erich Stenger), Jay demonstrated that caricatures and other popular commentaries and "curiosities" can be read symptomatically as indexes of broad trends and attitudes accompanying the history of photography.[55] It would be foolhardy to base historical explanations on

such testimonies only, but excluding them or relegating them to the status of marginal illustrations to lighten up traditional accounts would mean losing an opportunity to penetrate behind the photographs themselves. Jay's plea for linking photographs with relevant cultural forms and contexts resonates strongly with the goals of media archaeology, a "traveling" as well as an "outsider" discipline par excellence.[56]

Photography and the Emergence of the Cyborg

Following from these theoretical reflections, I would like to demonstrate how a media archaeology of photography might operate by taking as my starting point a cartoon with symptomatic value.[57] "Elephans Photographicus" was published in 1863 in the British satirical magazine *Punch*. It depicts the "front and back view of a very curious animal that was seen going about loose the other day" and named by "Dr. Gunther."[58] This refers to the German-born British zoologist Albert Günther (1830–1914), a leading ichthyologist and reptile taxonomist of the time. The *Elephans Photographicus* has four legs (the front pair much skinnier than the rear pair), protruding horns, an amorphous body with skin resembling a blanket thrown over something, and a single staring eye. This fantasy is based on the familiar figure of the photographer, who in those days had to use a tripod and operate under a hood to frame the view and to avoid accidentally exposing the sensitized plate. It must have been inspired by outdoor photography, although it is difficult to estimate how common the sight of a photographer operating outside the studio was by then.[59] The invention of the dry plate, which made the activity less cumbersome and encouraged amateurs to enter the field, was nearly a decade away.

Like most satirical cartoons, "Elephans Photographicus" comments on current issues. Along with Charles Darwin (1809–1882), with whom he corresponded, Dr. Günther was an active figure in the Zoological Society of London. He was well known for his matter-of-fact descriptions of the anatomical features of reptiles and fish, including their sex organs, which may have amused lay readers and inspired the mischievous staff of *Punch* to make its commentary. The cartoon appeared only four years after Darwin had published his landmark book *On the Origin of Species by Means of Natural Selection* (1859). The argument on evolutionary biology that it inspired furnishes a background explanation: through a curious transmutation, a new species has emerged—partly biological, partly technological. This refers to a broader discursive context, which was triggered by the industrial revolution. A basic issue was formulated by the pioneering industrial capitalist Josiah Wedgwood (1730–1795)—the father of Thomas Wedgwood (1771–1805), whose chemical experiments contributed to the invention of photography—when he famously stated that he wanted to make "such Machines of the Men as cannot err."[60]

The relationship between workers and machines within the industrial economy was fiercely debated in the nineteenth century.[61] The general terms of the debate can

1.1 "Elephans Photographicus," from *Punch*, April 26, 1862.

be demonstrated by the following views, which represent its opposite ends. In 1835, Andrew Ure, a vocal spokesman for industrialization, praised the factory as "a vast automaton, composed of various mechanical and intellectual organs, acting in an uninterrupted concert for the production of a common object, all of them being subordinated to a self-regulating moving force."[62] For Ure, as it had been for Wedgwood, the main challenge was "above all, in training human beings to renounce their desultory habits of work, and to identify themselves with the unvarying regularity of the complex automaton."[63] Charles Turner Thackrah, a doctor from Leeds, presented a counterargument, describing how "the animal machine—fragile at best, subject to thousand sources of suffering, and doomed by nature, in its best state to a short-lived existence, changing every moment, and hastening to decay—is matched with an iron machine insensible to suffering and fatigue."[64]

Early photography may seem unrelated to mechanized factory work, power looms, and assembly lines. It may not have been explicitly associated with industrial machinery, but in the minds of contemporaries, it evoked the relationship between the human and the machine. The photographic apparatus was, as cartoonists were quick to point out, at least a semiautomatic device. The photographer set up the situation, developed the results, and collected the financial benefits, but the pictures were essentially automatically produced by the sun.[65] It is not surprising that the photographer was soon depicted as sun-headed, as George Cruikshank, one of the most imaginative cartoonists of the era, did already in 1841 in his "Photographic Phenomena, or the New School of Portrait Painting."[66] The camera's relationship with humans concerned both the photographer and the sitters. Both situations produced a rich record of comical commentaries focused on mishaps, confusions, and accidents. Such emphases may have resulted partly from the discursive conventions of the cartoon as a genre. To what extent they reflected the actual experiences of both photographers and their clients is not self-evident; it has to be figured out (if at all possible) by research.

Cartoonists provided the photographic camera with animistic attributes so often that the issue requires attention. Different variants can be identified. The camera could become the head/body and the tripod the legs of a fantasy creature, who was shown knocking in vain on the door of the art academy, facing a portrait artist whose profession it was just about to steal, or even catching fugitive schoolboys or criminals

as a "photographic detective" roaming the streets. Here the camera was depicted as a kind of automaton come alive, an autonomous organism. This may have been inspired by the popularity of automata, self-acting, clockwork-operated mechanical puppets exhibited at fairs and showrooms. Automata had no practical purpose beside raising awe and promoting their makers' skills, but they were one of the starting points of industrial automation. As a case in point, the master automata maker Jacques de Vaucanson (1709–1782) also improved looms, inventing the punch card to rationalize production (the technique was perfected by Joseph-Marie Jacquard in 1801). Soon after publicly exhibiting his automata, he was made inspector of the French silk industry.[67]

The *Elephans Photographicus* belongs to a different line of development, where a merger of the organic with the technological has taken place. The camera has replaced the head, as in a German cartoon where a drunken photographer is enjoying his success by raising a glass of champagne while a (human) portrait painter is languishing in misery in his attic studio.[68] A comic variant shows such "biomechanical" creatures as targets of ridicule. The frontispiece of Bede's *Photographic Pleasures* depicts the photographer at the moment of "focussing a view to his complete satisfaction"—and about to be hit from behind by a raging bull a fraction of a second later.[69] In another cartoon, he gets his pocket picked.[70] The camera head could also be used to poke fun at a cuckold, as in a cartoon in the French series *The French Portrayed by Themselves*.[71] A roguish man who has taken up photography has persuaded the husband of a beautiful young woman to cover his head under the hood of his daguerreotype camera and to peek through its lens (viewfinders were not yet in use). Although the peeper claims that he sees nothing, the photographer (his treacherous cousin) persuades him to keep looking as he caresses his young wife behind his back.

An intriguing manifestation of the *Elephans Photographicus* is a late nineteenth-century miniature bronze statue that I once saw for sale on eBay. It provides another interpretation of the "one-eyed monster's" identity. The statue depicts a photographer shooting with a camera on a tripod. The camera, an ersatz head, is open from above, so the diabolical face of the person ensconced inside can be seen: the photographing monster is identified as the devil. The deeds of the devil, a popular cultural motif, have often been associated with media culture.[72]

Iconographic variants that reappear over and over again are topoi, stereotypical formulas migrating in cultural traditions and called back to service whenever needed.[73] The topos combines a transmitted, relatively unchanging element with interpretations assigned to it in changing circumstances. Much of the activity of signification within cultural processes takes place by means of topos manipulations through endless negotiations between the received and the added. The cartoonist who drew the *Elephans Photographicus* resorted to an existing resource, giving it a new interpretation in the thick of the debate on evolution. In contrast to in earlier topos sightings, the "mutation" was not expressed here by replacing the head of the human with the box-like camera but by another key feature, the replacement of the pair of eyes characteristic

of humans and many other animals with a single eye. This motif goes back to the mythological figure of the cyclops, which has—as a topos—come to signify things that are nonhuman in nature.[74] The amateur photographer was soon pictured as a monocular monster peeking at helpless victims such as bathing girls or lovers lost in their amorous reveries.

Photographers were not conceived as cyclopean only in visual traditions. To mention an example, in an 1867 article about "collecting manias," the writer explains how a lady kept asking for his carte de visite photograph. He was not able to fulfill the request because he "dreaded facing that terrible one-eyed monster" and wished to "delay the operation which [he] hated."[75] Jumping ahead a century, we encounter the topos in a science fiction story titled "Camera Obscura."[76] Its protagonist, Lieberman, is a photographer whose eyes are destroyed in an accident. His sight is restored by "prosthetic optics," as two artificial eyes are installed in the hollow sockets: "What he received was the result of years of careful design and testing: two monolithic microprocessors, grafted to the optic nerves by Soviet myo-electric synapses, which accepted information through laser encoded lenses. As a cosmetic concession, he received fully orbiting gel-coverings that glistened like natural eyes. Tiny sensors and servomotors moved them, once he had 'learned' how to control them. Each time he shifted his gaze or the iris changed diameter, Lieberman heard the resonant hum of the servos within his skull."[77] Peeking into his professional "Deardorff" camera with his new eyes, Lieberman begins perceiving curious things others are unaware of and is perplexed.[78] "In the evenings he sat alone in the den watching the camera, which sat on long legs like a great, one-eyed insect."[79] Even his collection of antique cameras starts looking strange: "On the opposite wall stood smoked plexiglass cabinets, their shelves holding cameras of past ages. Lieberman looked at them, their lenses staring like the eyes of caged, cyclopean beasts."[80] Finally, in a fit of despair, he tears his new techno eyes out and becomes blind again. "Camera Obscura" is one of the countless stories produced in the past few decades about the cyborg—a hybrid of the organic and the technological. It symptomatically points out something that is not generally acknowledged: rather than being of recent origin, the cyborg discourse can be linked to the earlier discourse.[81] The topos of the cyborg traversed cultural landscapes long before the concept was coined in 1960.[82] In the minds of nineteenth-century observers, early photographers were already considered cyborgs (although not named as such). Their eyes had been not only enhanced by the camera lens but replaced by it, turning the human into the super- or subhuman, depending on the interpretation.

The trajectories of the topos have been many and varied, including Dziga Vertov's theories about the kino-glaz (cinema eye) in the Soviet Union in the 1920s.[83] Vertov famously declared, "I am kino-eye, I am a mechanical eye, I, a machine, show you the world as only I can see it." The point of departure was "the use of the camera as a kino-eye, more perfect than the human eye, for the exploration of the chaos of visual phenomena that fills space."[84] Vertov's ideas can be connected with the already

discussed short story "Camera Obscura," even though he declares, "We cannot improve the making of our eyes, but we can endlessly perfect the camera."[85] The idea of the camera eye that sees more than the human eye was a guiding idea of modernism and had already manifested itself in the chronophotographic experiments of Étienne-Jules Marey and Eadweard Muybridge.[86]

Photographers' Portraits as Topos Manifestations

This media-archaeological background could be applied to an investigation of photographs that serve as portraits of photographers. It has long been a commonplace practice for professional photographers to pose with a camera, either for someone else or for one's own camera via a mirror. Such poses should be studied by paying particular attention to the relationship between the eyes and the camera lens. Keeping the purpose of the portrait in mind, it is understandable that photographs where the camera entirely blocks the photographer's eyes from view or even "replaces" his or her face are not very common.[87] This is related to the evolution of camera technology, which long ago dispensed with the hood, robbing new generations of *Elephans Photographicus* of their skins. Reflex cameras made it unnecessary to hold the camera in front of the face, which also affected the conventions of self-portraiture—the camera is held against the body, leaving the face completely visible (often without eye contact with the implied observer because of the lens's "belly perspective").[88]

Still, a substantial body of work activates the cyborg topos in one way or another. Generalizations are risky, but one formula recurs over and over again: the photographer's camera blocks one eye (immersed in its built-in viewfinder), while the other one is open, concentrated on the implied observer. Many examples can be found from the Internet, including websites selling stock imagery. The formula obviously searches for a balance between the human eye and the camera eye, perhaps emphasizing both humanism and professionalism.[89] Such photographs are often emphatically posed—the visible eye is active rather than subordinated to the hidden one that is supposedly doing the work through the viewfinder. In a more cyborgian variant, the camera lens "replaces" one of the eyes, while the other is framed or obscured by a viewfinder attached to the top side of the vertically held camera. An influential example is *The Photojournalist*, a photograph that Andreas Feininger (1906–1999) took in 1951 using his assistant Dennis Stock (1928–2010) as the model.

Feininger's photograph was published four years later in *Life* as part of a photo feature titled "Masked for Men's Work."[90] The caption does not identify Stock, stating simply, "Cameraman has viewfinder for left eye, camera lens for the right." In the photograph, the camera shutter is partly open, evoking the iris, while the pupil of the other eye, partly obscured by reflections, seems visible through the viewfinder. The published photograph is tightly framed to the head only, but a preserved contact sheet from the same session reveals that a series of wider framings including the torso were

also shot. The almost uncanny quality of these photographs was achieved by shooting them with a spotlight.[91]

The photo feature in *Life* included a short introduction contextualizing Feininger's photographs, identifying the five selected works as selections from a series that began with the shot of Stock: "In the back of his mind he kept thinking about making a set of stylized portraits to show how the instruments men use at their work and play often become an almost indivisible part of the men themselves."[92] This led to a "collection of masked men."[93] In the other photographs, we see a swimmer (a diver) with his "face plate," a jeweler wearing magnifying glasses, a fencer's face "behind his saber mask," and a doctor wearing a head mirror. The captions emphasize the uncanny quality of these sights, which have been segregated by Feininger from the realm of technologically enhanced work. The doctor's mirror transforms his face "into a single huge eye," while the jeweler's magnifiers "give him a face of many eyes." The diver's plate resembles "an old lantern," and the fencer's face behind the mask "looks like a death's head." Similar interpretations could be given to other photographs in Feininger's series, including a truly bizarre cyclopean portrait of a woman wearing a huge round scuba-diving mask.[94]

Many photographers have since produced homages to Feininger's classic portrait, said to be "among the best-known pictures ever to appear in *Life* magazine."[95] The picture's fame has also been enhanced by the Internet, a topos disseminator par excellence, where *The Photojournalist* can be encountered in many contexts.[96] It has even inspired a Play-Doh rendering by Eleanor Macnair and is sold as a T-shirt design.[97] A website of homages to Feininger's picture demonstrates the formation of a topos (sub)tradition and shows that some of the photographers are aware of the cyborgian connection. Wylie Maercklein has contributed a version titled *Half Machine*, while another photographer calls himself "Jorge_the_annihilator."[98] The cyborg association was captured retrospectively by *Time* when it characterized Feininger's photograph as a "portrait of what, at first glance, might be a shadow-shrouded cyborg—complete with mismatched lenses for the eyes" and later used the expression "a cowled cyborg."[99]

Feininger's photograph joined the existing topos tradition, which has continued to proliferate and branch out. Some variants, such as H. Armstrong Roberts's openly nostalgic version, hark back directly to the *Elephans Photographicus*.[100] A monster-like creature also appears in a portrait of the Magnum photographer Bruce Gilden, known for his harsh street portraits of criminals and mistreated humans. Gilden is dressed in his customary street gear. His face, under a tight knitted cap, is completely covered by the Cyclops's eye of his camera, while his other hand is holding his trademark flashgun. Another case worth mentioning is a self-portrait by the German photographer Umbo (Otto Umbehr), said to have been taken in 1952.[101] With his camera held in the familiar way, vertically in front of his left eye, the right eye is meticulously double-framed by a rectangular viewfinder, emphasizing its importance. An invisible background story gives the photograph, which Umbo used on his business card, a

particularly cyborgian weight: Umbo had accidentally lost the sight of his left eye, making the camera its replacement, a prosthesis.[102] Furthering the sense of loss, his huge negative archive—the combined product of his human and camera eye—was destroyed in 1943 by an Allied air raid on Berlin.[103]

Early in his career, Umbo, a Bauhaus graduate, produced a photomontage known as *Der rasende Reporter* (Roving, frantic, racing reporter, 1926), which has since become iconic. It was used in the publicity for Walter Ruttmann's film *Berlin: Die Sinfonie der Grosstadt* (1927) and as the cover illustration for a book by the journalist Egon Erwin Kisch, whose face is included as a cutout.[104] Here we encounter another version of the cyborgian imagination, a mechanical giant. Its human face has been enhanced by a camera eye and gramophone-horn ears.[105] The upper torso is a typewriter and the lower body a printing press. One of the legs, which are made of pens, has an airplane for a foot, and the other has a racing car, which enables the creature to leap over mountains, cities, and crowds.[106] The photomontage is part of the constructivist trend but also belongs to a broader context.[107] From a media-archaeological perspective, its most significant feature is the synthetic combination of the human, media machines, and means of transportation, which points toward their convergence into a single "organism." The camera eye belongs to a hybrid creature, in which the human element is not necessarily the dominant one any longer. It performs its duties under the risk of a machinic takeover, the creeping mastery of the cyborgian.

An important issue concerns the relationship of all these photographs to the contexts where they were produced. Obviously they form chains of influence, but how much do the links between them gain momentum from the times and places where they were produced or modified? To what extent do they transcend such conditions? What is the role of personal motivation or the creator's life history? None of these issues can be resolved by resorting to a single-layered explanation taken as "definitive." The answers should touch upon multiple determining factors. It will never be possible to know for sure why Feininger came to produce his series of "masked men" in the early 1950s. The series certainly reflected the growing importance of technological prostheses that amplified human capabilities, but it also questioned some of the attributes considered typical of the "human condition." Feininger's interests could be associated with the speculations about the "extensions of man" that Marshall McLuhan was beginning to develop around the same time. Both cases fit into even more extensive contexts, some of which point further back in time than the generally accepted outer reaches of early modernity.

Conclusion: In the Realm of the Machine Head

For the kind of approach delineated in this article, the composite machine body of Umbo's roving reporter provides a constellation of signs that points away from the exclusive domain of photography and toward media culture at large. That is the

direction where media archaeologists of photography should be heading. The cyborg topos gained inspiration from photographic practices but did not remain limited to their sphere. As other devices appeared, they soon merged with the human body as well. When the composer H. A. H. von Ograff celebrated the invention of Edison's phonograph with "The Song of Mister Phonograph" (1878), the cover of the sheet music displayed a dancing man with a phonograph head.[108] The human with a machine head has become an even broader topos tradition. The Internet contains arrays of pictures of radio heads, camera heads, telephone heads, television heads, computer heads, and any imaginable variant. A magazine advertisement for Sony's noise-canceling headphones shows a man comfortably leaning back in his airliner seat, totally oblivious to two ladies with megaphone heads chatting across the aisle. Media artist Lynn Hershman's *Phantom Limbs*, a series of photomontages of women with monitor and camera heads, also belongs here. Similar examples could be added ad infinitum.[109]

The body has been invaded by prostheses that monitor its functions both externally and internally, from Fitbit bracelets and heart pacemakers to nanobots that will in the (un)foreseeable future traverse blood-circulation networks much as the film *Fantastic Voyage* anticipated in 1966. Technological possibilities are constantly unfolding, but the ideas that inform them are not always new. No necessary synchronicity exists between the cultural imagination and the painstaking efforts made at research laboratories and engineering facilities. The body has been linked with mediated sounds, images, and other sensory experiences for over a century. This amplified body has been considered repulsive and passive, but the imagination has also turned it into a production machine and emitter of messages—a node within a slowly integrating media culture. I have often referred to Harry Grant Dart's 1911 cartoon "We'll All Be Happy Then" as a discursive elaboration of this process, decades before analysts like McLuhan and Jean Baudrillard stepped on the stage.[110]

Tracing the trajectories of media heads may seem superfluous for those whose interests are more hands-on and down to earth, yet more extensive archaeologies of humans strapped to machines both discursively and in actual practice can be developed. The topic emerged during the industrial revolution and gained much currency in the early twentieth century, with full mechanization, chronophotography, Taylorism, and the science of work as its corollaries. For the media archaeologist, it is intriguing to observe how actual production machines came to be accompanied by a veritable parade of imaginary mechanisms that deliberately exaggerated their features and revealed aspects that had been kept hidden behind utilitarian rhetorics. This is not the place to explore this overwhelmingly rich topic, but it is important to point out how seemingly innocuous and autonomous photographic practices became interwoven with this broader context. The practical requirement for neck rests and other supports to keep the sitters posing for portraits in early photographers' studios motionless led to fantasies about mechanical photographer's chairs pictured as torture machines.[111]

"Immobilizing" the sitter gained disciplinary significance when photography became applied—as Tagg has explained—to institutional practices such as cataloguing

murderers, prostitutes, and inmates of mental hospitals.[112] Those who were subjected to such treatments learned that blurred versus sharp photographs made a difference in a society increasingly permeated by surveillance. Special measures, including wooden bars held by force under the sitter's chin, had to be taken to keep the prisoner from moving the head during the exposure.[113] The ultimate restraining machine was the electric chair, which was used for the first time at Auburn Prison in the United States in August 1890.[114] It had the effect of immobilizing the "sitter" permanently. The cultural imagination did not remain idle while countless factory workers were forced to spend long hours performing repetitive tasks on assembly lines and disciplinary technology was applied to "aberrant" elements of society. Discursive devices accompanied actual machinic practices from the nineteenth century onward, including designs for the "spanking machine."[115]

The restraining machine became a staple of early twentieth-century avant-garde art as well. It was the meeting point of industrial mechanization, Sade's erotic fantasies, Freudian psychoanalysis, disciplinary systems, physiological science, popular-scientific fantasies, medical technology, religion, language games, entertainment machines, and so forth. Artists such as Marcel Duchamp, Francis Picabia, and Max Ernst and writers such as Franz Kafka and Raymond Roussel all imagined "bachelor machines."[116] They were discourse generators for the production of ambiguity and anxiety. As Michel Carrouges has written, a bachelor machine "succeeds the paranoic machine and miracle-working machine, forming a new alliance between desiring machines and the organless body for the birth of a new mankind or of a glorious organism."[117] As a case in point, the ingenious battery-operated torture and execution device described by Frank Kafka in his short story "In the Penal Colony" (1919) carved the sentence all over the convict's body until he lost his life.[118] Instead of marking a break, such imaginary machines gained inspiration from existing traditions that included rather than excluded photography.

The extended discussion on these pages supports one basic argument: an archaeology of photography, were it to be developed, should be a *media* archaeology. Instead of dealing with photography in isolation from other media practices, we should embrace the connections it has with them on all possible levels. Discussing photographs as symptomatic pointers to underlying developments should be part of the endeavor but never separated from the contexts—from material to discursive—that informed their becoming and within which they radiate impulses to other media forms. A media archaeology of photography should operate across its entire history, including its current proliferation on the Internet and recent practices such as the use of "selfie sticks" to snap self-portraits with smartphone cameras. This may seem very different from posing with a camera held against the face, but once again, proposing a cultural break would be premature, for smartphone selfies shot through the mirror are commonplace as well. A media archaeology of photography should reconnect all such practices with any kinds of media practices from the broadest perspective possible.

Notes

Critical comments by Emma de Vries (Leiden University) have significantly contributed to the final form of this study.

1. This meme string is based on a scene from Quentin Tarantino's film *Pulp Fiction* (1994).
2. Huhtamo and Parikka, *Media Archaeology.*
3. An exception is Zielinski, *Deep Time of the Media*. The author practices a kind of hero worship, having configured each chapter around an individual.
4. Glazer, "A New Kind of History?"
5. Newhall made his intentions clear in the preface to his *Photography: A Short Critical History*: "The purpose of this book is to construct a foundation by which the significance of photography as an esthetic medium can be more fully grasped."
6. Gernsheim, *A Concise History of Photography*. The book was based on Gernsheim, *The History of Photography.*
7. Gernsheim, *A Concise History of Photography*, 273.
8. Cuthbert Bede [Edward Bradley] poked much fun at the idea of photography as a "High Art" in his *Photographic Pleasures*, 24–31.
9. Fontcuberta, *Photography*.
10. Eder, *History of Photography*; Stenger, *The History of Photography*.
11. Scheurer, *Zur Kultur- und Mediengeschichte der Fotografie.*
12. Marien, *Photography*. My references are to the third edition; the fourth edition is the most recent.
13. Ibid., x.
14. Ibid., xiii, xv.
15. Ibid., 112–13.
16. Jay, *Cyanide and Spirits*, 34.
17. Strandroth, "The 'New' History?"
18. Ibid., 148.
19. Ibid.
20. Ibid., 150.
21. Tagg, *The Burden of Representation*, 3.
22. Ibid., 4.
23. Batchen, *Burning with Desire*, 188.
24. Ibid., 188–89.
25. Ibid., 189. Original emphasis.
26. Henisch and Henisch, *The Photographic Experience, 1839–1914*.
27. See also Edwards and Hart, *Photographs Objects Histories*.
28. In *Cyanide and Spirits*, Jay acknowledges his debt to his teachers, but states that "their own interests are markedly different from mine." Ibid., 260.
29. There used to be an elaborate website containing Bill Jay's collected writings, but as of November 10, 2015, the link http://www.billjayonphotography.com/ is, sadly, no longer active. However, a version of the website was stored through the Internet Archive's Wayback Engine and is available at the following link: http://web.archive.org/web/20110827123412/http://www.billjayonphotography.com/bio.html
30. *Cyanide and Spirits*, 2.
31. Ibid.
32. Jay, *Some Rollicking Bull*, 7.
33. Ibid.
34. Ibid., 8.
35. On Victorian pornographic literature, see Marcus, *The Other Victorians*; on pornographic photographs, see Nazarieff, *Der Akt in der Photographie*.
36. Ibid., 3–4.
37. *Cyanide and Spirits*, 39. The health hazards and accidents were already discussed, albeit briefly, by Stenger, *History of Photography*, 147–48.
38. Stenger, *History of Photography*, 218–40, 242–58.
39. *Punch, or The London Charivari*, October 4, 1890, 166.
40. This is one instance of women's growing involvement with technology at the time, as well as of their new liberties as flaneuses roaming public spaces without male escorts. The concept *flaneuse*, the female counterpart of *flaneur*, was coined by Friedberg, *Window Shopping*, 32–37.
41. Ito, Okabe, and Matsuda, *Personal, Portable, Pedestrian*, 308–9; Huhtamo, "Pockets of Plenty."
42. Detectives seem to have little do with "detective cameras," at least during this early stage.
43. See Krauss, *Die Fotografie in der Karikatur*, 76.
44. Collins, *The Story of Kodak*. The author wrote about the company in the foreword, "The goodwill it has accrued in the past one hundred and ten years is to Kodak a valuable commodity. But recognizing that its history is the basis of that goodwill,

the company agreed to cooperate with the telling of this history." This book is an example of biased historical storytelling media archaeology should counter.

45. Coe and Gates, *The Snapshot Photograph*; Ford, *The Kodak Museum*.
46. Jay, *Occam's Razor*.
47. Ibid., 146–52, 9. A. D. Coleman is the only contemporary writer on photography to whom Jay approvingly refers in his book.
48. Ibid., 11.
49. Ibid., 10.
50. Ibid., 102.
51. Jay, *Cyanide and Spirits*, 123.
52. Ibid.
53. Giedion, *Mechanization Takes Command*, 1969. Another reference point is Certeau, *The Practice of Everyday Life*, which is dedicated "to the ordinary man. To a common hero, an ubiquitous character, walking in countless thousands on the streets" (v).
54. Corbin, *The Life of an Unknown*.
55. Henisch and Henisch, *Positive Pleasure*; Krauss, *Die Fotografie in der Karikatur*. See also Morgan, *Photo Cartoons.*
56. Huhtamo and Parikka, "An Archaeology of Media Archaeology."
57. This section contains material from Huhtamo, "Cyborg Is a Topos."
58. Reprinted in Henisch and Henisch, *Positive Pleasures*, 29. It was published in *Punch, or the London Charivari* 44 (April 26, 1863): 249.
59. The cartoon may refer to a particular photographer or a specific incident, perhaps from London, but I have been unable to figure this out.
60. It is not clear when this now familiar dictum entered technocultural discourse. It may have happened via Thompson, *The Making of the English Working Class*, where it is quoted at 359n2. The reference is to McKendrick, "Josiah Wedgwood and Factory Discipline." McKendrick quotes the expression from Wedgwood's unprinted letter to his business partner Thomas Bentley, October 9, 1769 (ibid., 34, 46). Andrew Ure did not mention Wedgwood in his (notorious) classic *The Philosophy of Manufactures*.
61. Jennings, *Pandemonium, 1660–1886*. See also Seltzer, *Bodies and Machines*; Rabinbach, *The Human Motor*; Mazlich, *The Fourth Discontinuity*.
62. Ure, *The Philosophy of Manufactures*, 13–14.
63. Ibid., 15. Ure discusses here Richard Arkwright's (1732–1792) achievements.
64. Thackrah, *The Effects of Arts*, 82. Thackrah was responding to a position that preceded the publication of Ure's book. Qtd. in Sale, *Rebels Against the Future*, 31.
65. A famous cartoon shows the photographer taking a nap on the roof while the camera is doing the work for him. Gérard Fontallard, "Der Daguerrotypeur" (German version, ca. 1840), reprinted in Krauss, *Die Fotografie in der Karikatur*, 15.
66. Blanchard, *George Cruikshank's Omnibus*, 32. Cruikshank depicts the sun as a character painting a portrait of the earth. The text comments,

    And while the Moon,
    Who only draws the tides, is clean outdone,
    The Stars are all astonishment to see
    Earth—sitting for her portrait—to the Sun! (Ibid., 30).

    Bede (*Photographic Pleasures*, between 18 and 19) shows how "Mons. Daguerre introduces his pet to Mr. Bull," saying, "My Sun, Sir!" The boy has the sun as his head and drags a tiny camera on wheels (resembling a hobbyhorse).
67. For a brief biography and list of surviving documents, see *Jacques Vaucanson*. Vaucanson got his position in the silk industry in 1741.
68. "Photographie und Portraitmalerie," attributed to C. Tetzel and Hoenig, said to be from 1865 by Krauss, *Die Fotographie in der Karikatur*, 11. The information derives from Stenger's original illustrated German edition (1938) and seems to be based on an unidentified magazine page, hand dated 1865, in the Agfa-Gevaert Foto-Historama (see Krauss, *Die Fotographie in der Karikatur*, 91). A preannouncement for the *Berlin Illustrirte Montags-Zeitung* (in *Kladderadatsch* 10, nos. 14–15 [Berlin, March 29, 1857]) mentions a forthcoming comic illustration with the same title.
69. Bede, *Photographic Pleasures*, frontispiece and back jacket cover. Such a prominent

position emphasizes the key role of the illustration.
70. "Photographic Abstraction," ibid., plate between 40–41. The caption jokes, "When you calotype anything out of the common, the process must be accompanied by the most delicate manipulation."
71. Charles Vernier, *Les français croques par eux-memes* (Paris: Aubert et cie., ca. 1843), no. 4, repr. in Krauss, *Die Fotografie in der Karikatur*, 49; Henisch and Henisch, *Positive Pleasures*, color plate 5-1(a).
72. For example, in *diablerie* steroviews and the imaginary around peepshows. For a later example, see Roberto Rossellini's film *La macchina ammazzacattivi* (The Machine That Kills Bad People, 1948).
73. Huhtamo, "Dismantling the Fairy Engine."
74. An archaeology of the Cyclops topos will have to be left for another occasion. An interesting association with possible significance for photography is the tradition of comparing the sun to a "one-eyed monster." See Sayce, *The Principles of Comparative Philology*, 360. It has also been claimed that the ancient Greek myth of the Cyclops may have been inspired by fossils of *Deinotherium giganteum*, a creature distantly related to elephants. Its skull had a very large nasal opening, which could have been mistaken for the socket for a single eye. Mayell, "Cyclops Myth Spurred by 'One-Eyed' Fossils?" (I thank Emma de Vries for the lead).
75. Noble, "Collecting Manias," 482.
76. Monteleone, "Camera Obscura."
77. Ibid., 119.
78. This must refer to the professional cameras manufactured by L. F. Deardorff & Sons, Inc., produced from 1923 to 1988.
79. Ibid., 125.
80. Ibid., 127.
81. The story also contains other topos elements. When Lieberman began losing his mind, the lens of the Deardorff "faced him like the barrel of a weapon" (ibid., 129). Confusing the photographic camera with a gun is a repeated topos in the nineteenth-century photographic imaginary. Bede, among others, drew a cartoon about this; see Bede, *Photographic Pleasures*, plate between 54–55.
82. Clynes and Kline, "Cyborgs and Space."
83. Vertov, *Kino-Eye*, 17.
84. Ibid., 14–15.
85. Ibid., 15.
86. Tom Gunning has pointed this out in numerous studies.
87. A famous self-portrait of Ilse Bing (1931) shows her posing behind her Leica so that the camera is in front of the face but both eyes are visible. A mirror reflection shows Bing in profile with her camera. No doubt Bing has made an effort to prevent her face from being obscured while emphasizing her profession. Other compositions from the same session are also known.
88. The design of the reflex camera is a reconnection with the box camera obscura tradition, where the view in front of the camera was projected on a ground-glass "screen." Viewfinders that use an angled mirror to reflect the view on their horizontal top surface are technically camera obscuras.
89. These photographs could perhaps be defined as "occupational" like the highly priced daguerreotypes showing sitters with attributes of their professions.
90. *Life*, June 27, 1955, 16–17. See also Shalleck, *Masks*.
91. Andreas Feininger (age eighty-five) in Loengard, *LIFE Photographers*. Feininger's photo is used on the cover.
92. *Life*, June 27, 1955, 16–17.
93. Ibid., 17.
94. Yet others depict men wearing a welder's mask, diver's helmet, baseball catcher's mask, gas mask, and a megaphone strapped to the head. The image of the woman with the diver's mask can be found online but was not published here. See "Behind the Picture." Late in life Feininger thought that the photograph with Stock "should have made a cover. Some people at LIFE thought it would be the best cover ever, and others said, 'It's gruesome! We can't have it.' As usual, the wrong people won." Feininger in Loengard, *LIFE Photographers*.
95. "Behind the Picture."
96. About the Internet as a topos disseminator/generator, see Huhtamo, "Obscured by the Cloud."
97. See http://photographsrenderedinplaydoh.tumblr.com (accessed November 23, 2015). For the T-shirt, search Feininger at http://www.redbubble.com (design by Juilee Pryor, Australia).
98. "Feininger Tributes."

99. “Behind the Picture.”
100. “Photographer Behind View Camera Holding a Birdy,” USA, ca. 1950s, available at http://www.gettyimages.com (accessed November 23, 2015).
101. One source dates it 1948: http://www.kunstportal-bw.de/stgabbhahn4a.html (accessed November 23, 2015). Umbo used this portrait in his business card, with text printed partly over it. See Molderings, *Umbo*, 169.
102. The accident happened in 1946. Molderings, *Umbo*, 163.
103. Ibid., 161.
104. It appeared in the cover of the Czech version: Kisch, *Zuřivý reporter*. The book was first published in German as *Der rasende Reporter* (1925).
105. The camera is an Ermanox.
106. See plate 45 in Molderings, *Umbo.* The roving reporter is tapping the typewriter while in motion, associating the photomontage with current mobile media practices with smartphones.
107. In the Soviet Union, Wladimir and Georgii Stenberg produced an interesting graphically simplified version of Umbo’s photomontage for the promotional poster of Ruttmann’s film. Only the head with the camera and gramophone horn, clock, typewriter, and the hands have been retained in simplified form against the background of a skyscraper-like modernist building. Molderings, *Umbo*, 92.
108. (New York: G. Schirmer, 1878), reproduced in de Vries, *Dank U*, 50. The refrain of the song also personified the phonograph: “My name is Mister Phonograph and I’m not so very old; / My Father he’s called Edison, and I’m worth my weight in gold.”
109. The monitor head is a popular cliché. The idea of a “hollowed-out tv to be placed on one’s head (or tv-head)” (with instructions) has been posted by Jesse England, http://www.jemof.com/th.html. (the web link has unfortunately expired.)
110. On the cover of Huhtamo and Parikka, *Media Archaeology*.
111. See Henisch and Henisch, *Positive Pleasures,* 18–21.
112. Tagg, *The Burden of Representation.*
113. Jay, *Cyanide and Spirits*, 107–8.
114. Essig, *Edison and the Electric Chair*, 245–53.The electric chair has inspired artists like Andy Warhol and Tom Sachs, who created his own version as an installation that would obviously work (*What Would James Brown Do?*; 1999). Sachs is also known for his equally operational *Chanel Guillotine (Breakfast Nook;* 1998).
115. See Farrell, “The Spanking Machine.”
116. The term “bachelor machine” (*machine célibataire*) was coined by Carrouges, *Les machines célibataires*. See Clair and Szeemann, *Le macchine celibi / The Bachelor Machines*.
117. Quoted in Clair and Szeemann, *Le macchine celibi / The Bachelor Machines*, 19.
118. Kafka, “In the Penal Colony.” Kafka likened the device to vibrators used in hospitals. For an archaeology of vibrators, see Maines, *The Technology of Orgasm*.

{ 2. }

A Mirror with Wings

Photography and the New Era of Communications

SIMONE NATALE

In 1853, the celebrated trance-writer and prophet of the American spiritualist movement Andrew Jackson Davis compared spirit communication to a kind of telegraphic channeling. In explaining how "spiritual telegraphy" could connect a mother to her son, he mentioned another new technology that had spread in the United States during the previous decade: photography. In Davis's words, "the actual condition of the son is daguerreotyped upon the mother's brain—telegraphed, so to speak, or impressed, as perfectly as any object can be painted on the physical organ of sight."[1] As he was writing, photography and electric telegraphy were two novel technologies of communication that were largely perceived as revolutionary. Writers, scientists, intellectuals, and even visionary prophets like Davis celebrated their impact and relevance. It made much sense, in such a historical moment, to refer to the two media in conjunction with each other, as he did, using the daguerreotype and the telegraph as exchangeable metaphors for spiritual communication.

A century and a half later, much of that cultural climate has been lost. Media historians have explored the nineteenth century as an epoch where new understandings of communication emerged and the fundamental tenets of today's media culture were established.[2] Yet, despite the fact that photography was introduced and developed in the same historical period and notwithstanding the field's purportedly systemic approach to the interactions between different media, photography has remained a relatively marginal subject in media history, secondary to telegraphy, wireless, sound recording, film, television, and other visual media. Conversely, art historians have, at least until very recently, underestimated the extent to which

photography interacted with the new media of communication and transportation in the nineteenth century.[3]

This chapter aims to address these gaps by questioning photography's place in the broader history of nineteenth-century communication media. Focusing on the context of the mid-nineteenth-century United States, I aim to unveil how photography participated in the transformation of how communication was conceived, administered, and used. First, I show that photography is related in several ways to telegraphy, railroads, and postal service, some of the technologies and systems that revolutionized communication in the mid-nineteenth century.[4] Second, I argue that the emergence of photography was informed, as was telegraphy, by a dream of going beyond previous boundaries of space and distance. Photography was conceived as a medium that put images in movement, allowing pictures taken from reality to be carried, marketed, and transported. In fact, photography was from the very beginning a medium of communication in the strictest sense of the term. Putting images taken from reality in movement, and allowing them to circulate across space, photography was perceived and used as pertaining to a range of new technologies that were transforming the very functioning and conditions of human communication.

The Telegraph of Art: Mediated Communication Around 1839

As scholars such as Jeffrey Sconce and John Durham Peters have shown, nineteenth-century spiritualism and psychical research were extraordinarily receptive toward innovations in communication technology.[5] It is therefore not surprising that the relationship between photography and other communication media was sometimes acknowledged with greater clarity in occultist and spiritualist writings than in texts produced within other contexts and fields.[6] An apt example of this dynamic is an article entitled "Facts in Spiritual Science," published in 1854 in a spiritualist periodical. The article mentions three cases of recently recorded spiritualist phenomena, each having to do with media communications. The first case occurred in a railroad car, where Miss Rachel Ellis, a spiritualist medium, was addressed in French by an unknown woman. Despite not knowing French, the medium found herself uttering words in that language, as if possessed, and conducting a lengthy conversation without having the slightest idea of its content. The second case had to do with the mediated communication of words: the author recounts how a woman communicated with her deceased daughter at a spiritualist séance, where a message from the beyond was sent through rapping as well as through letters that she locked up in a drawer for delivery to the spirit of her deceased daughter.[7] In the third reported case, another new communication medium, the daguerreotype, makes its appearance. A picture was given to a medium, who recognized in it the likeness of a man she had seen in the spirit world. As the report underlined, the medium had never seen the man in person, but only through the mediation performed by both photography and spiritual communication.[8]

The insertion, in all the three reported "spiritual facts," of media of transportation and communication, such as the railway, the telegraph, the post, and photography, was hardly a coincidence. In opening the article, the author seems to hint that his piece is on the miracle of spiritualist communication as much as on the new conditions created by transformations in the way communications were exchanged and mediated. He particularly stresses the striking novelty of the ways through which spirits manifested themselves. Demonstrations of the spirits' identity and existence are "often as unexpected as they are singular and convincing"; scarcely a day passes without bringing "some new and striking illustration of Spiritual presence and power."[9] He lived in a world, after all, where communications traveled through new, unprecedented channels, changing in irreparable ways the perception of distances of time and space. The anecdotes he recounts link the experience of novel forms of spirit manifestation with that of communication and transportation media. The railway journey was the occasion for entering into contact with distant worlds that had until recently been confined to the realm of imagination; telegraphy and the postal system built connections with loved ones in spite of separation by space; and the daguerreotype carried images taken from reality, allowing our eyes to see what they had previously not been able to reach.

Although the context of its publication may seem unusual, the article encourages us to look at all these media in concert with each other, rather than in isolation. In this section, I follow this encouragement by pointing to relations between photography and three technological shifts that revolutionized human communications in nineteenth-century America: the introduction of the telegraph, the development of a national railroad system, and the transformation of postal exchange from an apparatus used by a limited number of individuals to a network employed by large masses of ordinary Americans.

Despite a striking coincidence of dates—the first public demonstration of telegraphy was in 1838, just one year before the publication of Daguerre's invention, and the first telegraph line was officially opened in 1844—correlations between the cultural reception of photography and the telegraph have been largely disregarded. Relevant exceptions can be found in essays by Geoffrey Batchen and William Uricchio. While Batchen reports some circumstances common to the history of photography and telegraphy,[10] Uricchio argues that photographic technologies contributed, like communication media, to stimulating a new experience of time, space, and event, based on the sharing of "spatial and temporal dimensions that exceed those normally available to human subjects."[11] As Susan S. Williams has noted, from the 1840s the daguerreotype was often mentioned in the same breath as the telegraph as the supreme examples of the American progress.[12] Popular publications that gave accounts of the major inventions of the nineteenth century often positioned photography and telegraphy together as protagonists of the technological revolution of the nineteenth century.[13] In 1856, for instance, *Harper's New Monthly Magazine* listed among "the most notable gifts of the United States to the world" the electric telegraph, the art of photography, and the discovery of the properties of sulfuric ether when inhaled.[14]

Electricity, on whose power the telegraph was based and which was often presented during the nineteenth century as an omnipotent, quasimagical force,[15] was also related to the functioning of photographic technologies. In an early history of the electric telegraph, published in 1852, the author reasoned that electricity was also to be found "in the sun's rays, and on the surface of Daguerreotype plates, delineating the human features."[16] According to Batchen, the attempt to transform electricity into visual form symbolically unified the emergence of photography and telegraphy in the mid-nineteenth century. In July 1838, the Englishman Edward Davy was granted a patent for a telegraphic system, in which a current being received was passed through a moving paper tape soaked in potassium iodide, leaving a colored mark: "electricity was thereby turned into a legible image, a kind of image produced very much like a photograph (automatically, as a chemical reaction to received energy)."[17]

Hopes and fears that emerged in connection with the new technologies of telegraphy and photography often overlapped. The innovative nature of photography was sometimes underlined by mentioning its relations to communication and transportation technologies: for instance, the *Philadelphia Photographer* in 1866 labeled photography "the railway and telegraph of art," observing that it too was able to "carry us to points afar."[18] Common associations between the daguerreotype and telegraphy also concerned the risks connected with abuses of these technologies. Thus, in an article that expressed concern about the production of duplicates of works of art, the London magazine the *Athenaeum* observed that the daguerreotype was "almost equally active in the forgery of property [as] the telegraph in the forgery of news." In this age of fakery and forgery, the art collector required constant watchfulness and accurate knowledge, "as it requires a large intelligence to interpret the wayward and fantastic communications of the electric telegraph."[19]

Another point of contact in the early development of telegraphy and photography is to be found in the acquaintance with photographic technologies of Samuel F. B. Morse, the main contributor to the introduction of the electric telegraph in the United States. Morse, who may have fantasized about inventing a photographic system as early as 1821,[20] met Daguerre in Paris in 1839. At this meeting, Daguerre and Morse agreed to demonstrate to each other the wonders of their respective inventions. Morse was also the author of the first recorded reaction to Daguerre's invention by an American, in a letter in the New York *Observer* on April 20, 1839.[21] He became one of the pioneers of the daguerreotype in the United States, opening a portrait studio in association with J. W. Draper in New York in 1840 (fig. 2.1).

The influence of the railroad on nineteenth-century photography and visual culture has been discussed by several authors, most notably the German cultural historian Wolfgang Schivelbusch. He argues that railway journeys stimulated the emergence of a new kind of visual perception: the spectacle of the landscape in movement allowed passengers of trains to experience a form of "panoramic travel."[22] But the relationship between the railroad and photography was not limited to the representation of landscape and movement. The first two decades after Daguerre's invention were

2.1 Maull and Polyblank, *Portrait of Samuel Morse*, 1855–60. Albumen silver print, 31.6 × 26.5 cm.

characterized by improvements in both photographic and transportation technologies. In several cases, the railroad and the daguerreotype came to be strategically allied. Reportedly, for instance, the opening of the railroad in the Belgian town of Courtrai was to be greeted through a particular application of the daguerreotype:

> The camera obscura is to be placed on an eminence commanding the royal pavilion,—the locomotive engine, the train of wagons, and the major part of the *cortège*, and is to be brought into action exactly at the time of the delivery of the inauguration speech. A discharge of cannon is to be the signal for a general immobility, which is to last the seven minutes necessary for obtaining a good representation of all the personages present. The plate is afterwards to be enclosed in lead and deposited under the first stone of the foundation of the station at Courtrai.[23]

Both railway and photography "were new technologies that lent themselves to the projects of media governance and nation-building."[24] In nineteenth-century America, photography and the railway became symbolic protagonists of the conquest of the Western frontier.[25] As Anne M. Lyden has pointed out, "nowhere else on earth did railroads and photography advance so completely side by side, mutually reinforcing each other."[26] The first of the four surveys of continental lands planned in the late 1860s

2.2 Carleton Watkins, *View on Lake Tahoe*, 1877. Albumen silver print, 40.3 × 52.7 cm.

by the American Department of War, led by geologist Clarence King and including professional photographers of the caliber of Timothy H. O'Sullivan and Carleton Watkins, was conceived as part of a program of economic expansion alongside the transcontinental railroad system (fig. 2.2).[27]

Not only the federal government but also railroad companies contributed to the connection between photography and the train, commissioning photographers to document the natural attractions along the new routes and the towns that were springing up there. Photographic images were seen as an opportunity to attract financial support and to tempt passengers to travel to the destinations now accessible by train.[28] Furthermore, the railroad was among the favorite subjects of nineteenth-century American landscape photographers. In an essay about the artistic representation of the railway, Leo Marx has argued that the representation of the railroad expressed "a heightened sense of change itself—its accelerating pace and its potentially all-encompassing scope."[29] In this sense, no other means of representation could represent the railway better than the new mechanical imaging of photography.

The emergence of photography also has something to share with the increase in postal exchange that followed the introduction of cheap postage in nineteenth-century

America. Although mail delivery is much older than the telegraph, it was only in the middle of the nineteenth century that ordinary Americans began participating in a regular network of long-distance communication. During this period, the American Congress, through substantial reductions in the cost of postage, stimulated "a communications revolution that was as profound in its consequences for American public life as the subsequent revolutions that have come to be associated with the telegraph, the telephone, and the computer."[30] Between 1840 and 1860, the number of letters carried annually by the U.S. Post Office increased from about 27 million to about 161 million, leading to the emergence of a new perception of access to postal services, which started to be described as one of the fundamental conditions of modern life.[31]

Despite some notable exceptions,[32] historians of photography have largely ignored the connections between early photography and postal services. Yet, as David M. Henkin rightly emphasizes, the roughly contemporaneous emergence of daguerreotype portraiture and cheap postage is striking.[33] After the 1845 reform of the American postal services, the cost of adding a daguerreotype to a letter was reduced to nothing, and photographic portraits could travel free throughout the United States. Dead-letter inventories of the time demonstrate that daguerreotypes and later photographs on paper had become a staple item of postal exchange as early as the end of the 1840s.

Sent by post, the photograph was, like the autograph letter, a mode of representing absent persons. The symbolic relevance of sending one's portrait to relatives and friends has probably been underestimated in the historical examination of photography's early cultural reception. Photography made everyone's image easily transportable, allowing masses of Americans to enjoy imaginary contact with distant others. The circulation of photographic portraits by post was further increased by events such as the Civil War and the California gold rush, which took hundreds of thousands of Americans away from their homes for long periods of time. Postal communication was their primary link with their disconnected families. Photography also played a role in strengthening such contacts. In fact, as Henkin has suggested, in cases such as that of Iowan J. H. Williams, receiving photographs of a son could be such a powerful form of symbolic contact that it came to be considered "as good as a short visit."[34]

The popularization of the postal system also had a strong impact on business. Items sold by correspondence included photographic materials, thereby facilitating the diffusion of photography throughout the country. As an advertisement for the sale of photographic chemicals and materials pointed out, "the facilities of intercourse by mail, rail-road and telegraph are now so speedy and sure, that all have the privilege of trading in the city, at city prices."[35] Professional photographers used the mail to extend the reach of their art and commerce. William Mumler, a spiritualist portrait photographer who offered his customers portraits enriched by the presence of superimposed figures that were allegedly spirits of the dead, employed the mail to reach customers from distant spiritualist communities; the same strategy was employed by other spirit photographers.[36] Cartes de visite of famous personalities were likewise commercialized per post, playing an important role in the establishment of a seminal

celebrity culture in the nineteenth century.[37] The postal system was also instrumental in bringing together networks of amateurs dispersed in space. One notable example is the Postal Photographic Club, founded by C. W. Canfield and E. L. French of Aurora, New York, which was designed to educate amateurs in rural areas.[38]

In the mid-nineteenth century, the introduction of photography coupled with a range of contemporary transformations in communications, from the telegraph to the railway and the postal system. In what sense, however, did photography challenge the ways communication was performed? What was photography's place in the burgeoning media culture of the nineteenth century? As the next section shows, examining Oliver Wendell Holmes's classic essays on photography may provide us with key insights to answer these questions.

Communicating the Image: Photography and the Annihilation of Space

In 1861, Oliver Wendell Holmes published the second of his three essays on photography in the *Atlantic Monthly*. After discussing photography's innovative character, Holmes invited his readers on "a brief stereographic trip,—describing, not from places, but from the photographic pictures of them which we have in our own collection."[39] From Niagara Falls to Broadway, from the Dead Sea to the pyramids, the reader was carried on an imaginary journeys around the world by means of stereoscopic photography. Recalling another common narrative of his time, the annihilation of space realized by transportation technologies, such as the railroad and the steamboat, and by the new electrical communication media, such as the telegraph, Holmes framed photography in a world where traditional boundaries of distance were becoming increasingly out of date—and large catalogues of distant places and locations were made available to the viewer by a burgeoning stereographic industry.

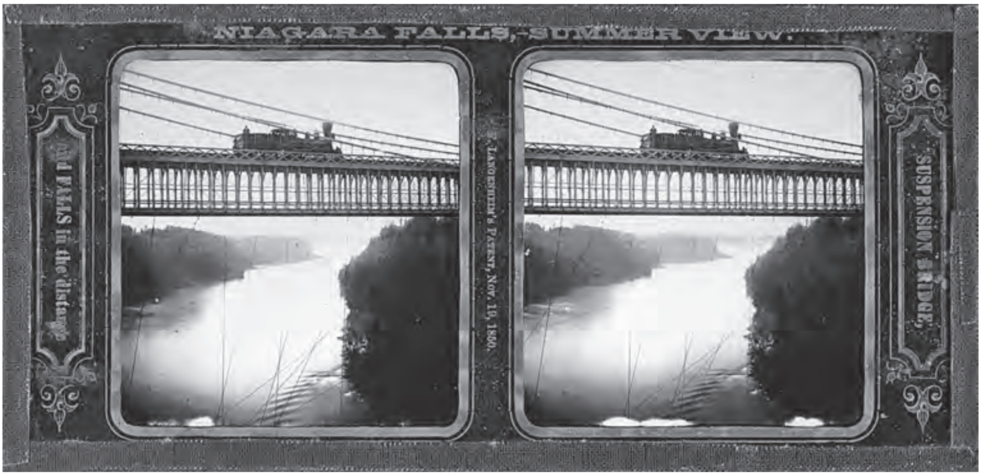
Notwithstanding the fascination of such imaginary journey with the stereoscope, the most frequently cited among Holmes's essays on photography is not the one describing the "photographic trip" but the first, published in the *Atlantic Monthly* in 1859, in which he famously termed photography "the mirror with a memory."[40] This metaphor is usually invoked as evidence of photography's capacity to deceive time, memorizing on the plate's surface a vision that would appear only momentarily on a mirror. Less attention is given, however, to the fact that in this essay Holmes stressed photography's power to defeat not just time but also space. A few pages after his reference to "the mirror with a memory," Holmes depicted stereoscopic photography as "a universal currency of these banknotes, or promises to pay in solid substance, which the sun has engraved for the great Bank of Nature."[41] A photograph, according to Holmes, stands in relation to its referent in the same way that banknotes stand to the monetary value inscribed on them. Interpretations of this argument have been various. Alan Trachtenberg considered this to refer to the uncertain status of money, and hence of representation, in antebellum America.[42] Nancy M. West, on the other

hand, claimed that Holmes intended to hint at the status of capitalist production.[43] In line with authors such as Martha Sandweiss and Miles Orvell, I point to another interpretation: what banknotes and photographs had in common was their capacity to transform matter into paper notes that were easily exchanged and moved.[44]

The primary aim of money is to circulate within the market, to become a universal form of exchange that can be readily carried and transferred.[45] Like banknotes, photographs allowed viewers to make images circulate. In this sense, photography has in common with the new communication media that it went beyond existing barriers of distance. "By making a sheet of paper reflect images like a mirror and hold them as a picture,"[46] as Holmes put it, photography transformed reality into an easy-to-handle commodity that could be carried, marketed, and sent to distant locations. While engravings and other forms of graphic media put images in circulation well before the invention of photography, a new industry for photographic reproductions strongly enhanced this process, bringing viewers in contact with images that had been taken from reality in countless sites around the world.

In Holmes's essay, the idea that images are commodities with their own commercial value is central. Stereoscopic photography, to which the essay is dedicated, was one of the first photographic forms to be produced and commercialized as an industrial commodity.[47] Originally conceived as an optical device to illustrate a theory on vision, the stereoscope was transformed into a widely popular amusement in the 1850s, when it was applied to photography to give a three-dimensional effect. The stereographic industry, from the mid-nineteenth century to the 1930s, published between three and six million different images; stereoscopic photographs can thus be considered the first mass visual medium.[48] The stereoscope became the dominant visual mode in which images of distant places and journeys were recollected or imagined. The circulation of images reproducing the most famous sights of the world, converted into spectacle by the photographer, could now be purchased and viewed by Victorians in the comfort of their houses (fig. 2.3).[49] Something similar was also achieved through magic lantern slides, by which photographic projections of distant locations were made available to wide audiences around the world.

The relationship between photography and the circulation of commodities was expressed in an article in the magazine *Littell's Living Age* in 1854. The author enthusiastically mentions the possible applications of photography to aid traveling salesmen in promoting their wares: instead of traveling to an open market to buy goods, the salesman could now bring a picture of those goods to one's own home.[50] A context in which photography's capacity to circulate becomes particularly evident is photographic jewelry. Lockets and other objects that incorporated photographs were extremely common during the nineteenth century. In this context, photography was transformed through its inclusion as part of the wearer's body. As Geoffrey Batchen notes in an essay dedicated to vernacular photography, "this is photography literally put in motion, sharing the folds, volumes, and movements of the wearer."[51] Another interesting example of the inclusion of photography in a commercial commodity of wide circulation is the eight



2.3 Langenheim Brothers (Frederick and William Langenheim), *Niagara Falls, Summer View, Suspension Bridge, and Falls in the Distance*, about 1856. Glass, 6.5 × 6 cm.

thousand picture cards produced by Ogden's Tobacco Company and distributed with packs of cigarettes, which promised to offer a "panorama of the world at large."[52]

The exchange of daguerreotypes and other photographic images in the rising postal system of nineteenth-century America, discussed at the end of the previous section, also supports this interpretation of Holmes's comparison between photography and banknotes. Henkin has documented that photographs and money were among the most popular items of postal exchange in the mid-nineteenth century.[53] This is easily explainable by recalling the fact that both items could be conveniently attached to a letter, allowing a form of payment or economic support at distance in one case, a visual connection between distant persons in the other.

As these examples show, the mobility of pictures and other photographic items was embedded in photography's material character.[54] As material objects, photographs are able to circulate and to challenge distances of space. Jennifer Roberts has recently argued that, before the telegraph, portability and communicability were synonymous, while after its introduction, words became faster and pictures were literally "left behind—their stubborn materiality and specific visuality crystallized by their recalcitrance to electronic translation."[55] Yet, as Roberts aptly notes, the immateriality of telegraphic transmission also made the materiality of visual configurations more viable, adding new emphasis on how photographs and other artworks were moved and transported across space. The materiality of photographs, in fact, was responsible for binding them to the limitations of space as well as for their capacity to outdo such limitations, moving across the United States and the world.[56] The same applies to the containers where they were placed and to the different supports that made up their materiality: a history of photography's mobility is also a history of boxes, albums, frames, and photographic supports.[57]

Since the first experimentation with this new technology, the instantaneity of transmission was heralded as the main achievement of electric telegraphy.[58] In contrast, early photography was a lengthy process, one that could require seconds or even minutes of exposure for an image to be taken. Yet the rapidity with which photographic pictures could be taken and developed was striking when compared with painting and drawing. Commentators stressed that photography created in the span of just a few seconds something that required an accomplished artist several days of work—a rapidity of execution that could not be equaled by any other medium for producing pictures.[59] The "wonderful rapidity of photographic action" was saluted as one of the qualities that maximized photography's impact in the realms of science, industry, and art.[60] Additionally, by making it possible to visualize two places at the same time, photography also created the illusion of synchronicity and disembodied presence, two effects that characterized the impact of electrical communications as well.[61] The possibility of electronic and photographic presence allowed for the establishment of communication links that, as argued by John Durham Peters, were conceptualized as empathic connections with distant others.[62] In fact, historians of photography have frequently stressed how photographic portraits contributed to the establishment of emotional links between people separated in space; recently, media scholars interested in the history of emotions have shown that something similar also shaped the early reception of electric telegraphy.[63]

Photography's challenge to the boundaries of space and distance in the nineteenth century is further attested by its immediate application to travel. Travel and tourism were part of the arguments in favor not only of the railway but also of photography.[64] The dream of traveling to the most distant and exotic destinations in the world by means of photographs or stereoscopic cards was evoked by many commentators of the time. An article in the *Photographic Journal*, for instance, suggested that photography "brings to us in the cheapest and most portable form, not only the picture, but the model, in a tangible shape, of all that exist in the various countries of the globe. . . . By our fireside we have the advantage of examining them, without being exposed to the fatigue, privation, and risks of the daring and enterprising artists who, for our gratification and instruction, have traversed lands and seas."[65] As Joan Schwartz points out, at the same time that the railway and the steamship made the world more accessible at a physical level, photographic technologies made it visually more accessible: "the photograph became a surrogate for travel at a time when travel was the premier avenue to knowledge of the world."[66]

The practical and symbolic relevance of circulation, exchange, and traveling in the acceptance and practical use of photography suggests that photography contributed in the nineteenth century not just to a shift in the techniques of representations but to the broader development of novel forms of mediated communication that characterized the age of electrical communications. By rendering the image easily transportable or, in other words, by transforming the real into banknotes, photography demands a place in that annihilation of previous boundaries of space that is

usually connected to the development of telegraphy, railroads, and modern postal services in nineteenth-century America. The era of modern communication, whose beginnings are often identified by media historians with the emergence of electrical telegraphy, was also the era of photography. To paraphrase Holmes's words, the new photographic medium was not only a mirror with a memory but also, and perhaps especially, a mirror with wings.

Notes

A shorter and much different version of this text was previously published as Simone Natale, "Photography and Communication Media in the Nineteenth Century," *History of Photography* 36, no. 3 (2012): 451–56.

1. Davis, *The Present Age*, 194.
2. See, among many others, Gitelman, *Scripts, Grooves, and Writing Machines*; Otis, *Networking*; Kittler, *Discourse Networks*; Flichy, *Dynamics of Modern Communication*; Marvin, *When Old Technologies Were New*.
3. This gap has recently started to be addressed by a growing body of literature addressing photography in relationship to the history of other media. See in particular Taws, "When I Was a Telegrapher"; Roberts, *Transporting Visions*; Hill and Schwartz, *Getting the Picture*.
4. While one might argue that the railroad was a technology of transportation rather than communication, it is important to note that the terms "communication" and "transportation" were virtually synonymous in the nineteenth century. The history of the railway is inseparable from the history of telecommunications: telegraphy, for instance, was instrumental in the organization and functioning of railway networks; also, the kind of cheap and rapid postal system that emerged in the first half of the nineteenth century would have been unthinkable without the railway. See, in this regard, Czitrom, *Media and the American Mind*.
5. Sconce, *Haunted Media*; Peters, *Speaking into the Air*.
6. The history of occult beliefs and psychical research—a realm constitutionally open to extraordinary connections and influences—frequently invites associations between historical events and phenomena that are usually regarded as distinct. This is certainly the case with the association between photography and other media; see also my examination of the close connections between X-rays and wireless telegraphy in psychical research at the end of the nineteenth century: Natale, "A Cosmology of Invisible Fluids."
7. The spirit rappings through which spirit communication was performed were usually compared to telegraphic exchanges by early spiritualists.
8. Brittan, "Facts in Spiritual Science."
9. Ibid., 7.
10. Batchen, "Electricity Made Visible."
11. Uricchio, "Ways of Seeing," 123. For other, more recent attempts to link photography and telegraphy, see Taws, "When I Was a Telegrapher"; Roberts, *Transporting Visions*.
12. Williams, "The Inconstant Daguerreotype," 166.
13. See, e.g., Iles, *Flame, Electricity*; Laxton, "Electric Telegraphs," 9.
14. "Editor's Table," 411.
15. Morus, *Frankenstein's Children*.
16. Jones, *Historical Sketch*, v.
17. Batchen, "Electricity Made Visible," 36.
18. Quoted in Lyden, *Railroad Vision*, 4.
19. "Our Weekly Gossip," 312.
20. Batchen, "Electricity Made Visible," 37. It is important to note that Morse was, in addition to being an inventor of electrical devices, a very famous painter; in his career, the trajectories of communication and visual media converge with particular clarity.
21. Trachtenberg, *Reading American Photographs*, 15.
22. Schivelbusch, *The Railway Journey*.
23. "The Daguerreotype."

24. Foster, "Capturing and Losing," 141.
25. Leonardi, *Il paesaggio americano*.
26. Lyden, *Railroad Vision*, xii.
27. Trachtenberg, *Reading American Photographs*, 123–24.
28. Lyden, *Railroad Vision*, 4.
29. Marx, "The Railroad-in-the-Landscape," 185.
30. John, *Spreading the News*, vii.
31. Henkin, *The Postal Age*, 2.
32. For instance, Alison Morrison-Low has discussed how communication between the pioneers of photography Henry Fox Talbot and David Brewster was facilitated by the improvements in the British postal system. Morrison-Low, "Brewster." See also Smith, *Disciples of Light*.
33. Henkin, *The Postal Age*, 59. See also chapter 3 of this book.
34. Henkin, *The Postal Age*, 57.
35. Seely, "To Photographers and Daguerreotypists."
36. See Natale, *Supernatural Entertainments*, 135–68.
37. Browne, "Looking at Darwin"; Di Bello, "Elizabeth Thompson."
38. Greenough, "Of Charming Glens," 271–72.
39. Holmes, "Sun-Painting."
40. Holmes, "The Stereoscope and Stereograph," 738.
41. Ibid., 747.
42. Trachtenberg, *Reading American Photographs*, 19.
43. West, "Fantasy, Photography, and the Marketplace."
44. Sandweiss, *Photography in Nineteenth-Century America*, 42–43; Orvell, *The Real Thing*.
45. On the relationship between money and artistic representation, see Shell, *Art and Money*.
46. Holmes, "The Stereoscope and Stereograph," 738.
47. McCauley, *Industrial Madness*; Plunkett, "Selling Stereoscopy."
48. Babbitts, "Stereographs," 129.
49. Strain, "Exotic Bodies," 76.
50. "Busy with Photographs."
51. Batchen, *Each Wild Idea*, 66.
52. Strain, "Exotic Bodies," 76.
53. Henkin, *The Postal Age*, 9.
54. Edwards and Hart, *Photographs Objects Histories*.
55. Roberts, *Transporting Visions*, 6.
56. Edwards, "Material Beings."
57. See Edwards and Hart, "Mixed Box." Photography's capacity to defeat time is also grounded on its materiality. See in this regard Nicholas Yablon's study of early time capsules from the end of the nineteenth century: Yablon, "Posing for Posterity."
58. Morus, "The Nervous System."
59. Munro, "The Optical Stranger," 172–73.
60. "Wonderful Rapidity."
61. Schwartz, "Records of Simple Truth," 21–22. On the concept of electronic presence and disembodiment, see Sconce, *Haunted Media*.
62. Peters, *Speaking into the Air*.
63. This became particularly evident when the telegraphic link broke down and messages failed to be delivered. Malin, "Failed Transmissions."
64. See, among others, Schwartz and Ryan, *Picturing Place*; Hoelscher, "The Photographic Construction."
65. Claudet, "Photography," 266.
66. Schwartz, "Records of Simple Truth," 14.

{ 3. }

The Traveling Daguerreotype

Early Photography and the U.S. Postal System

DAVID M. HENKIN

Though better remembered for other things, Samuel F. B. Morse figures prominently in standard accounts of the beginnings of photography in the United States. An early champion and practitioner of the new art and the individual generally credited with introducing photographic techniques to American readers and audiences, Morse straddled in his larger career the line between art and science that photography would both walk and unsettle. Morse's special relationship to photography began in 1839 during an extended visit to Paris, where he had traveled in the hope of selling patent rights to his electromagnetic telegraph, the technology with which his name would forever be linked. While exhibiting his new invention to the Académie des Sciences, he learned of the experiments of Louis Jacques Mandé Daguerre, who was presenting to the Académie around the same time. Morse took an intense interest in Daguerre's work, which he saw as a formidable rival for public interest and state patronage, and arranged for a private meeting. After examining sample daguerreotypes under a magnifying glass, Morse confirmed their wondrous, detailed verisimilitude.

Morse's enthusiastic response to Daguerre's demonstration assuaged or perhaps redirected his initial competitive impulses and turned him into an avid promoter. Photography appealed to Morse for a variety of interesting reasons, including the fact that he himself had experimented unsuccessfully earlier in the decade with the idea of capturing the imprint of light in a camera obscura. As Sarah Catherine Gillespie suggests in a recent dissertation, Morse identified with Daguerre in part because the American artist and inventor was attuned to the affinity (and not simply the rivalry) between daguerreotype photography and electromagnetic telegraphy. Morse, the

son of an eminent geographer, instantly saw the utility of Daguerre's invention for enhancing armchair travel—allowing visitors to a diorama, for example, to glimpse unprecedentedly faithful images of distant locales. Photographs could, in that sense, overcome distance. Morse may also have been impressed, like several contemporary observers, by the way both inventions harnessed natural forces—light and lightning, as one 1858 celebrant of the two inventors observed—to produce inscriptions.[1]

In retrospect, we are more likely to notice the sharp differences between these two epochal nineteenth-century technologies. Photography revolutionized *visual culture* and *print culture* by appearing to recalibrate the relationship between the visible world and its two-dimensional paper representation. Telegraphy, on the other hand, revolutionized *communications culture* by appearing to annihilate distance between speakers and receivers of messages and by decoupling the phenomenon of long-distance communication from the phenomenon of long-distance transportation. Morse's telegraph system, moreover, isolated the verbal component of communication and inaugurated a new communications regime under which images of the sort that Daguerre was producing would be left behind, forced to travel, as Jennifer Roberts reminds us, at the slower pace of animals, ships, and railroad cars.[2]

But although telegraphy introduced a major conceptual rupture in the history of American media, and especially in the history of news transmission, it did not immediately and altogether transform the way most people living in the United States actually communicated with one another—or the way they experienced distance in their social relations. The electromagnetic telegraph, which Morse never succeeded in persuading the federal government to adopt as a national telecommunications medium, remained too expensive for the regular exchange of private messages. But as telegraph exchange became the special province of newspapers and merchants, ordinary Americans began exploiting new opportunities to conduct relationships at a distance through the operations of a much older network: the U.S. Post Office, which was radically altering and lowering its rate scale at precisely the same time that private companies were stretching telegraph wires across the country. It was during these same years, of course, that daguerreotypes and other photographic images would proliferate spectacularly in the United States, and it was the postal system, rather than the telegraph, that facilitated this proliferation. Cheap postage also framed new patterns and expectations of how cameras and photography might be used, specifically the expectation that personal portraits could move easily across vast distances.

* * * * *

Although the reports of Morse and others on the birth of photography generated interest and curiosity in the United States, it was not entirely clear to American observers (or to anyone else) how Daguerre's invention might be productively or profitably applied. Daguerre himself had imagined that the camera would be most suitable for depicting still-life scenes and landscapes. Morse, who had worked as a portrait painter, avowed interest in the capacity of the camera to capture human facial expressions, but this was an idiosyncratic perspective in 1839. For multiple reasons,

personal portraits seemed an especially unlikely and unpromising use of the camera. Daguerreotypes required lengthy exposure times (at least five minutes in the early years of the camera) that demanded extraordinary and excruciating composure from living subjects. Daguerreotype artists would often position their subjects against iron headrests, and many early portraits show men and women in evident discomfort. Such circumstances presumably interfered with the capacity of the camera to capture natural or individual facial expressions, but even if a daguerreotypist succeeded in recording an accurate likeness, the results might not flatter the customer. Verisimilitude, as photographic pioneers quickly came to understand, was not necessarily an advantage in human portraiture.

Nonetheless, daguerreotype portraits became immediately and immensely popular in the United States. By 1850, taking a picture of someone's face was unquestionably the predominant application of Daguerre's invention and the primary social use associated with photographic technology. An overwhelming majority of daguerreotypes taken nationwide at midcentury were posed portraits of individuals or (less commonly) families. The practice of daguerreotype portraiture fueled the spread of photography more generally in the United States, especially in a handful of large American cities, beyond anything that was happening in Europe at the time. Approximately two thousand daguerreotypists were practicing in the United States within a decade of the introduction of the art. A hundred different studios operated in New York City alone. As of 1853, New York held more daguerreotype studios than all of England. American daguerreotypists also produced prodigious volumes of images—three million a year, according to an 1853 estimate.[3]

Why daguerreotype portraiture took off so dramatically in the United States remains a complex and interesting question. Some of the appeal can be seen in the leading uses to which Americans put the daguerreotype in the 1840s and 1850s—and the meanings they ascribed to their portraits. Alan Trachtenberg famously delineated two principal modes of photographic portraiture from this period. "Emulatory" portraits, such as those featured in Mathew Brady's gallery displays of "Illustrious Americans," enlisted the camera in producing legible models of virtue imprinted on the faces of distinguished men. In more diverse, private settings, American consumers also treasured "memorial" daguerreotypes, which froze the image of beloved individuals in time, promising a certain kind of psychic and symbolic protection against the ravages of aging, forgetting, and death. Emulatory portraits, Trachtenberg underscores, were exhibited and published; memorial ones were typically preserved as keepsakes. But many daguerreotypes of both varieties also circulated along paths of interpersonal connection. The popular fad of distributing photographic likenesses as cartes de visite flourished especially in the 1860s, well after the daguerreotype had been displaced by photographic techniques that produced limitless copies from a single negative—and after the introduction of a multi-lens process that could generate an inexpensive series of images in slightly different poses and from varying angles. As Nell Painter has demonstrated in her study of Sojourner Truth, the distribution and sale of such cards

amounted to a form of photographic self-publication. But even in the daguerreotype era, when a studio visit would yield unique images, the commissioned memorial portrait was destined to circulate. Frequently, Americans had their pictures taken in order to send them somewhere distant via mail.[4]

From their early years, daguerreotype portraits became a staple item of postal exchange. Daguerreotypes (and later other photographs) washed up in large quantities in the dead-letter inventories that newspapers advertised and described with voyeuristic glee. Thousands of undelivered photographs met that fate each year, typically accounting for most of what got classified in the "valuable letter" category. Most photographic portraits arrived at their destination, and they are referred to frequently in the correspondence of Americans from all classes throughout the middle decades of the nineteenth century.[5]

The appeal of posting daguerreotype portraits in the 1840s was broad and powerful. Daguerreotypes were novelties, and their consumers were mostly the residents of and visitors to the handful of large cities where the art flourished. For many Americans living in rural areas, first contact with a photographic image of a friend or relative would often come in the mail. An enclosed portrait also transformed the character of epistolary communication by providing a new visual component to a medium that relied on literary expression, penmanship, hair, or other metonymic keepsakes to connect physically separated correspondents. Far more compellingly than those other metonyms, the photographic conjured possibilities of physical communion. Daguerreotypes, in other words, appeared to make good on the longstanding rhetorical aspiration and promise of handwritten letters to incarnate absent friends and family. Upon receiving his son's "likeness" in the mail, Iowan J. H. Williams went so far as to pronounce it "as good as a short visit." Sabrina Swain of Ohio, while writing to her husband that she regretted having consented to his trek to California, took some comfort upon receiving his photograph. "I think I never saw anything but life look more natural," she told him in an 1849 letter and related the response of their young child: "I showed it to Little Cub, and to my astonishment and pleasure she appeared to recognize it. She put her finger on it, looked up at me and laughed, put her face down to yours, and kissed it several times in succession. Every time it comes in her sight she will cry after it." Projected onto her daughter, Swain's own substitution of the daguerreotype for the husband reads as an equivocal mix of satisfaction and frustration, and thus represents broader patterns of response to long-distance mail that posted and fetishized photographs brought into relief.[6]

The claim of photographic portraits to represent the bodies of absent correspondents was enhanced before 1851 by the fact that the daguerreotype was not a mechanically reproducible negative but rather a unique image of a particular moment in time. Posted photographs were therefore more like signed holograph letters and less like printed documents than they would later become once the face recorded on film could be endlessly duplicated and promiscuously circulated. Daguerreotype portraits could more convincingly be read as personal gestures of communication. "Its silence speaks words

of love to me which the rest do not understand," Mary Wingate wrote of her husband's daguerreotype mailed from California, "and when I look at it I step forward in imagination to that time when I shall see your own dear self not *through a glass*" (emphasis in original).[7] The unique daguerreotype image was both a bodily relic, like the locks of hair that were frequently enclosed in letters, and an intimate epistle in its own right.[8]

Photographic portraits were especially valued devices for maintaining postal contact during the California gold rush, when large numbers of Americans (along with gold-seekers from parts of the world not serviced by the U.S. Post Office) left their homes for what they hoped or insisted was a short period of time, expecting in the interim to maintain some symbolic presence within those homes. Under such circumstances, correspondents turned to daguerreotype portraits to assert continuity and contiguity during what they hoped would be a temporary separation. Daguerreotyping flourished as a trade in midcentury California, particularly in San Francisco, where portrait studios lined the central streets near Portsmouth Square.[9] Topography certainly contributed to the appeal of San Francisco as a site to practice photographic art, but the demand for personal portraits made such a profession profitable. Forty-niners were unusually fond of posting and receiving daguerreotypes, and they celebrated the good fortune of living in an age when this novel technique of visual representation was available to them. "Thanks to the inventer who brings yourself in imagination present with me," Jonathan Locke wrote to his wife in 1850.[10] Correspondents on both sides of the Sierras waxed poetic about the significance of these miniature photographs—"likenesses," as they most frequently called them—and elaborated fantasies around the specter of presence that daguerreotypes evoked. "I am only sorry that it is not the original that is to go and the likeness to remain," one miner wrote to his fiancée in an accompanying missive. She received the portrait with "unexpected joy," observing that her absent beloved "could have sent nothing but yourself, that would have been half so acceptable." Another forty-niner informed his wife that he stared at her likeness "generally when I go to bed and when I rise. . . . I enjoy looking at you much."[11]

Gold rush correspondents were interested not simply in iconic keepsakes or erotic visual aids. They also wished to track changes and developments in the physical appearance of loved ones whom they could not otherwise see. This was especially important in the case of very young children. Mary Wingate mailed a daguerreotype of their daughter to Benjamin but cautioned him that the camera could not capture the "roguish twinkle in her eye" when she played. Such supplemental disclaimers appeared frequently in the letters that came bearing portraits. The sender often apologized for the sobriety of the image or insisted that it failed to do the sitter justice. Responding to critical comments by his sister, Franklin Buck defended his portrait but saw fit to add that "my friends say it looks rather older than the original. Sarah says more care worn." Another brother's letter relayed his friends' positive assessment of the portrait he enclosed but assured his sister that he was capable of better: "I have been very much disposed to send one taken in my hat, which is white and really makes a beautiful contrast in the picture. Still I

shall reserve this and you may see it one of these days." Yet another new arrival in San Francisco deferred the portrait altogether. "I would send you my Daguerretype by this letter if I was in good trim," he explained to his sister, "but I am very poor in flesh." He assured her that he was rapidly gaining weight, though, and that "as soon as I look decent I will send it and when I do I want you to send me yours."[12] Daguerreotypes facilitated a certain kind of discourse about the vicissitudes of weight and hairstyle (one correspondent predicted that his likeness would prompt tonsorial criticism from his mother—"Mother dear it is expensive here to visit the barber," he remonstrated preemptively).[13] But even when daguerreotypes were not enclosed, forty-niners used the post to keep their correspondents up-to-date on changes in appearance. Young Henry Perry, writing to his parents in Connecticut from a midjourney stop in Rio de Janeiro in 1849, assured his mother that he now weighed 140 and 1/2 pounds, "10 lbs more than I weighed the day before I left new York."[14]

Travelers to California were hardly typical Americans, but as high-profile early adopters of the communications device that was the posted daguerreotype, they publicized and dramatized broader patterns and developments in American social relations that attended the spread of photography in the United States. One of those crucial developments, often overlooked amid the familiar narrative of industrial growth, territorial acquisition, and demographic mobility, was the spread of postal correspondence itself. Although the United States had been transmitting mail since the beginning of the republic, before the 1840s the postal system had served primarily to broadcast news and facilitate commerce. By keeping letter postage rates high to subsidize the cheap circulation of newspapers, the Post Office Act of 1792 effectively restricted the postal exchange of letters to special occasions, wealthy correspondents, and merchants, for whom the financial scale of long-distance transactions and remittances might easily absorb the costs of letter postage. For most people living in the United States, letter postage was too high to permit regular exchanges, especially across significant distances—since letter postage was assessed on the basis of number of sheets and miles traveled. Between 1816 and 1845, for example, the postage on a single-sheet letter traveling more than four hundred miles (say between Albany and Pittsburgh) would be 25 cents, or between a quarter and a third of the average daily wage of a non–farm laborer. A longer journey would cost 35 cents. An additional page would double the rate. The postage on a short letter from New York City to Troy in 1843 was more than 50 percent higher than the price of shipping a barrel of flour over the same route.[15]

Beginning in 1845, however, Congress enacted a major reform that radically lowered the costs of mailing a letter and redefined the mission of mail service. Arguing that increasing the volume of mail would raise overall revenue in a system whose major costs were fixed, and hoping to ward off potential competition from private delivery firms, American postal reformers adopted the model of Rowland Hill's penny post, introduced in 1839 in Great Britain, with its emphasis on mass correspondence. To encourage popular participation, letters would now be charged on the basis of weight,

rather than per sheet, at a radically reduced rate of 5 cents per half ounce for a distance up to three hundred miles and 10 cents per half ounce for greater distances. Six years later, the Postal Act of 1851 set the basic rate at only 5 cents for any half-ounce letter traveling up to three thousand miles within the United States, effectively eliminating distance as determinant of cost. The 1851 law also introduced a 40 percent discount for prepaid postage, allowing half-ounce letters to travel virtually throughout the country for 3 cents.

As was the case in Great Britain, cheaper postage did not entirely and instantaneously fulfill reformers' bold predictions.[16] Yet it is clear that uniformity, prepayment, and affordability did spark a major jump in the volume of mail in postal circulation. In the first decade following the 1845 act, the number of letters mailed in the United States more than tripled, reaching 132 million in 1855. This figure did not necessarily represent the sudden birth of a nation of avid correspondents. Letter writing remained a disproportionately urban activity in an overwhelmingly rural society, and commercial mail undoubtedly accounted for a majority of the total volume. Moreover, some of the increase may have come from the shift of patronage from private express companies to the government post.[17] Nonetheless, the slashing of rates to less than one fourth (in many cases) of what they had been had a major material and symbolic effect on the practice of writing letters.

Historians have largely ignored the historical connection between photography and the mail, but the roughly contemporaneous emergence of daguerreotype portraiture and cheap postage is highly suggestive. At the most practical level, the daguerreotype would not have traveled so easily under the old postal regime. Before 1845, enclosing an image would have doubled the already discouraging price of personal correspondence. After the first reform, the cost of adding a photographic image to a letter was reduced in many cases to nothing, barring of course the unlikely event that it pushed the weight of the letter over the one-ounce threshold. Because many correspondents sought to encase daguerreotypes, postage cost could of course rise with the weight of the case or frame.[18] But in principle, the photographic image itself could travel for free throughout the United States, a point that became especially clear by midcentury, when portraits began appearing on paper. And even when plates and cases added to the cost of mailing a daguerreotype, distance did not. These simple considerations enhanced the appeal of the daguerreotype portrait and help explain Americans' interest in what might seem in retrospect an unlikely application of photographic technology. Trachtenberg is surely correct to underscore the value Americans attributed to the daguerreotype as a bulwark against the vagaries of personal history and the ravages of time. But it was also the case that patrons of the new art were drawn to portraits for their ability to traverse large *spatial* divides. A traveling likeness, as the phenomenally successful daguerreotypists of the gold rush understood, was valued for its wings and not just its durability.

If new postal rates enhanced the appeal of daguerreotypes, the availability of cheap mechanical likenesses added an inducement to correspond, at least for those who

inhabited or visited cities. Photography introduced a compelling visual dimension to the act of postal self-representation. "I will send you my likeness," Aaron Stevens of Cedar County, Iowa, wrote to his brother in Minnesota during the U.S. Civil War. "It is not a very good one, but then you see how I look somewhat. I wish you would send me yours."[19] In the larger scheme of a midcentury postal revolution that swept through numerous countries on both sides of the Atlantic Ocean, the possibility of sending photographs was surely a relatively minor factor. In Great Britain, for example, the introduction of cheap postage and the proliferation of correspondence predated widespread purchasing of daguerreotype portraits. Still, to many Americans, photographs were a central feature and a favorite option of the transformed postal medium. While in Britain the bulk of mail correspondence following the reforms took place, much as reformers anticipated, within short distances (much of it within London), advocates of postal reform in the United States explicitly linked arguments for cheap postage to the nation's geographically dispersed and perpetually mobile population. Reformers insisted that America's exceptional demographics made the case for rate reductions and uniformity especially urgent. Elsewhere the members of the same family "live and die at their native homestead, or within a few miles of the spot where they were born," argued the *New Englander* in 1843. "The American, on the other hand, is born for migration," and families routinely scatter "hundreds of miles apart." As the members of New England households moved to Illinois, Wisconsin, and Iowa, the evangelical magazine proceeded to imagine, countless impulses for long-distance communication would inevitably arise in "hearts that warm toward their kindred here."

> There is the teacher whose trials would be lightened, and his heart cheered, if he could freely communicate by letter with those who were once his instructors or his companions in study. There is the minister of the Gospel, the home missionary, to whose self-denying work free communication with friends, brethren and helpers far away, is of the greatest moment. There is the young man, exposed to strong temptations, whom a free and frequent correspondence with his mother, or his sisters, or with another friend still dearer to his hopes, might keep from falling. There is the anxious wife or mother, who sees the health of some dear one in the family beginning to fail, and who would like to get one word from the old family physician. There are the planters of new towns and villages, laying the foundations civil, ecclesiastical and literary, who would love sometimes to get a short answer to one short question from the judge, the 'squire, the minister, the schoolmaster, or the deacon, whom they knew in old Connecticut or in the old Bay State. But how, in that new country, can they raise the half dollar to pay the post-office tax upon a single question?[20]

While following the lead of Great Britain, the United States entered the new postal era with a distinctive set of expectations about how the mail might function as a mass medium.

Photographic portraits fit comfortably and congenially within this conception of postal correspondence as a medium for conducting and performing relationships at a distance. This was particularly conspicuous in the case of family ties. With the onset of cheap postage, the personal letter offered most Americans both a vehicle and a model for a kind of ongoing familial intimacy that did not depend on physical presence—even as personal letters repeatedly and formulaically invoked such presence as an ideal.[21] By sending daguerreotypes to absent friends and family, midcentury correspondents sought to negotiate the vast distances that frequently defined a postal relationship. Photographic images in a letter emphasized the mobility of persons and encouraged the fantasy of instantaneous transportation that was central to the appeal of mail (even when delivery was irregular, uncertain, or subject to delay). In the process, traveling daguerreotypes affirmed a broader epistolary project and thematized a growing telecommunications culture.

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Though not typically noted by scholars of photography or communication, the historical convergence of postal correspondence and daguerreotype portraiture as explosive trends in mid-nineteenth-century America underscores a critical and illuminating link between those two phenomena. At the most fundamental level, the U.S. postal system had, since its inception, forged and cemented the long-distance commercial bonds and the broad diffusion of authoritative information that proved indispensable to the viability of photography as a profession in the middle of the nineteenth century. But only in the 1840s did the post come to be used and celebrated by masses of Americans for the core social purposes that we now associate (often nostalgically) with snail mail. Thus, while the older postal infrastructure underwrote the commercial development of photographic techniques and practices, a much more specific historical shift in postal policy encouraged the spread of photographic portraiture.

The prominence of daguerreotype portraits in the mail inventories during the 1840s was not preordained, but it was a reciprocally formative and illuminating development in the history of the post and the photograph as modern media. Contrary to the assumption of many historians who rely upon epistolary sources, postal correspondence was never simply about the exchange of holograph manuscripts, bearing eloquent verbal exchanges of intimate feeling. From the beginning of mass participation in the act of exchanging letters, such communication involved images as well as texts. And from the beginnings of mass participation in the ritual of photographic portrait exchange, such portraits were media of communication, not simply media of representation or reproduction.

Framed in lockets or bound in albums, as they often appear in the catalogues—and in the historical imagination—daguerreotypes possess an aura of solitude that makes it harder to appreciate their mobile and communicative features. But, as Jennifer Roberts demonstrates in her recent study of the transportation of canonical paintings in early America, even heavy, solid works of art bore traces and told stories of their own complex travel lives.[22] The light, miniaturized impressions of human faces that flooded American cities at midcentury were built to travel, to circulate, and to communicate.

Notes

1. Gillespie, "Samuel F. B. Morse and the Daguerreotype."
2. Peters, *Speaking into the Air*; Roberts, *Transporting Visions*.
3. Lippert, "Consuming Identities"; Taft, *Photography and the American Scene*, 63.
4. Trachtenberg, *Reading American Photographs*, 21–33; Painter, *Sojourner Truth*, 185–99.
5. See, for numerous examples, Henkin, *Postal Age*, 191n38.
6. Folmar, *"This State of Wonders,"* 80; Sabrina Swain to William Swain, April 15, 1849, in Holliday, *The World Rushed In*, 80.
7. Mary Wingate to Benjamin Wingate, April 1, 1853, Wingate Correspondence, Bancroft Mss.
8. For examples of mailing locks of hair, see Henkin, *Postal Age*, 191n42.
9. Lippert, "Consuming Identities"; Palmquist and Kailbourn, *Pioneer Photographers of the Far West*; Fardon, *San Francisco Album*, 11–24. For examples of the postal exchange of daguerreotype portraits during the early years of the gold rush, see Henkin, *Postal Age*, 208n24.
10. Jonathan F. Locke to his wife, in Benemann, *A Year in Mud and Gold*, 158.
11. Christman, *One Man's Gold*, 244, 250. As with correspondence more generally, posted daguerreotypes could strike their recipients as tokens of absence as much as presence. In the particular case of the gold rush, the longer someone stayed in California, the more easily he could be reduced, in the mind of his correspondent, to a pictorial representation. Mary Wingate emphasized this point to her husband by invoking the perspective of their young daughter, who asked her mother whether her absent father had feet. "A new idea seemed to strike her that her dear father was a man, not a picture." Some months later, Mary reiterated the concern. "Ella talks a great deal about *Pa* and her *own* father but has some doubts as to whether he is a real man or a picture." Mary Wingate to Benjamin, November 1, 1852, June 16, 1853.
12. Mary Wingate to Benjamin, July 10, 1853; Buck, *A Yankee Trader*, 131. John McCracken to his sister Lottie in Benemann, *Year of Mud and Gold*, 215; Paschal Mack to "Dear Sister," December 13, 1852, Bancroft [C-B 547:61].
13. John McCracken quoted in Benemann, *Year of Mud and Gold*, 215.
14. Henry Perry to his parents, April 18, 1849, Henry Perry Letters, Newberry Library Mss. Franklin Buck also details his weight to his sister: Buck, *A Yankee Trader*, 131.
15. Henkin, *Postal Age*, 15–41; Pred, *Urban Growth*, 82.
16. For a detailed accounting of the immediate drop-off in postal revenues after the first reduction (and the Post Office Department's insistence that the reforms were not principally to blame), see the 1846 report of Postmaster General Cave Johnson, printed in *Niles' National Register*, December 19, 1846, 246.
17. Henkin, *Postal Age*; Pred, *Urban Growth*, 224–25; Zboray, *A Fictive People*, 112; John, "Recasting the Information Infrastructure for the Industrial Age," 70.
18. Some correspondents also chose to pay higher fees to express companies when transmitting daguerreotype portraits. A newspaper report noted that a daguerreotype costing fifty cents in New York in 1855 would cost twice as much to mail to San Francisco. "The Pacific Express Company—Its Freight Charges," *New York Daily Times*, November 15, 1855, 4. I am indebted to Amy Lippert for this citation.
19. Stevens to his brother, August 2, 1858, in Carroll, *War Letters*, 44.
20. "The Post-Office System, as an Element of Modern Civilization," *New Englander* 1 (1843): 22–23.
21. Henkin, *Postal Age*, chap. 5.
22. Roberts, *Transporting Visions*; see especially the chapter on James Audubon, 69–115.

{ 4. }

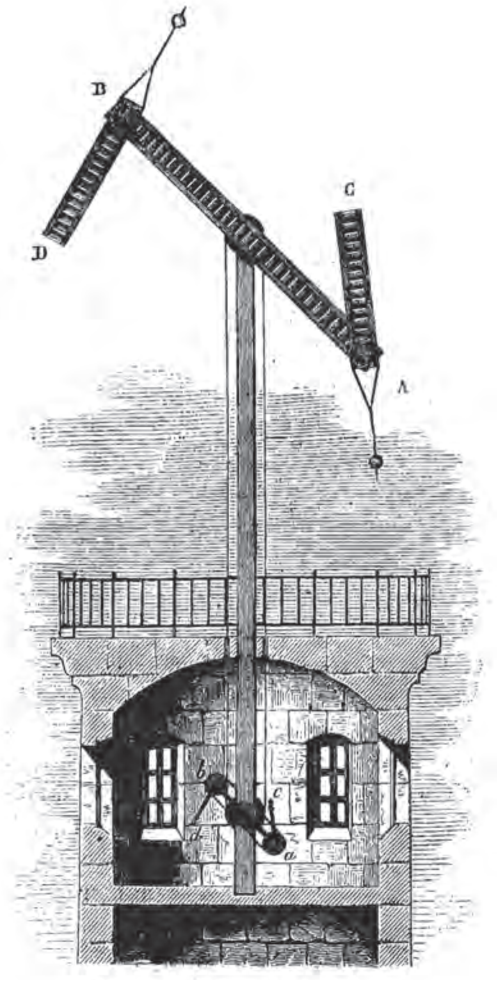
The Telegraph of the Past

Nadar and the Time of Photography

RICHARD TAWS

Discussing his adopted city of Paris, where he lived from 1830 until his death in 1837, German writer Ludwig Börne described it as "the telegraph of the past, the microscope of the present, and the telescope of the future."[1] Börne's technological analogy is at once familiar and discordant. City-as-microscope makes sense as a vivid descriptor for a world becoming accustomed to new forms of spectacular realism, even if microscopy itself was hardly a technique specific to the nineteenth century. Telescope-town also works, the predictive powers of an urban milieu that fostered scientific innovation, as well as novelties in art and fashion, aligning with our expectations about the modern city's future-oriented *telos*. But "the telegraph of the past"? Why would telegraphy look backward, and what kind of past might it communicate?

While the other two devices clearly operate by visual means, telegraphy resonates for us as a technology grounded in a turn away from representation, a marker of the modern world's drift toward elusive, immaterial, virtual presence.[2] But the telegraph that Börne had in mind was, in fact, avowedly visual in character. His allusion was not to electrical telegraphy, but to the Chappe optical system, which operated in France from 1794 until 1855.[3] The longevity of the Chappe telegraph—developed by Claude Chappe and his brothers during the revolutionary Terror and still current in the aftermath of the 1830 Revolution—meant that it was, arguably, able to offer a more convincing metaphor for historical thought than the technological and social caesura suggested by electrical telegraphy. Chappe's system, used almost exclusively for military signals, involved a relay of windmill-like metal "arms" set atop towers and prominent buildings (fig. 4.1).[4] In Paris, where the telegraph was a familiar presence on the horizon, these included at various points the Louvre, Saint-Sulpice, Saint-Eustache,



4.1 "Télégraphe de Chappe," cross-section of apparatus, from Louis Figuier, *Les merveilles de la science, ou description populaire des inventions modernes* (Paris: Furne, Jouvet, 1868).

and Saint-Pierre de Montmartre. The arms of the telegraph were manipulated by an operator to form a series of discrete shapes, each one encoded with words or phrases. An operator at the next station viewed the signals through a telescope, reproduced them, and transmitted them down the line. The messages were transcribed and decoded at their final destination. Associated irrevocably with the Revolution and Empire—indeed, promoted in its early years as especially revolutionary in character—this system was remarkably successful, spreading for over five thousand kilometers within France.[5]

Although by the 1830s telegraphy seemed increasingly an instrument of a repressive state, the metropolis, via association with the telegraph, figures in Börne's neat one-liner as a site where the ghost of the 1789 Revolution might appear in contemporary guise. The time of telegraphy not only extended forward but demanded, as Börne intimated, a reckoning with the past. Moreover, the new temporal possibilities enabled by the "sun telegraph," as Richard Cobb called it—a technically incorrect but intuitively photographic description—were not all associated with the new speed of communication it brought to bear, but with more far-reaching insights into the relation between technology, politics, and histories of media.[6] This essay turns to the afterlife of optical telegraphy, not to trace a linear technical history characterized by patterns of evolution and decay, rupture and regress, but to suggest that questions of time and visuality continued to inflect the subject of telegraphy in France after the 1850s, providing a means of conceptualizing the significance of diverse media. As the century progressed, the emergence of new procedures with an ability to conjure historical time—most notably photography, in its various forms—did not lead to a decline in telegraphic metaphors: rather, it gave them new life. Telegraphy and photography, both of which promised to

transcend time and space, were intertwined at crucial junctures in their histories and in the career of one of photography's foremost practitioners and most allusive chroniclers, Gaspard-Félix Tournachon, better known as Nadar. A youthful photomontage from the mid-1850s shows Nadar burlesquing the form of the telegraph, an image whose production coincided with the replacement of Chappe signals by electrical transmissions, making a declining medium central to the aesthetic and historical possibilities of a new one (fig. 4.2).[7] As we shall see, Nadar was to return to this motif at the end of his career, although by then it was also filtered through remembrance of the telegraphic devices that had followed Chappe's invention.

4.2 Nadar (Gaspard-Félix Tournachon), *Photomontage of Félix Nadar*, 1855–60. Salted paper print, 19.8 × 13.9 cm. The J. Paul Getty Museum, Los Angeles.

Sic transit!

In *Paris, ses organes, ses fonctions et sa vie dans la seconde moitié du XIXe siècle* (1875), writer and photographer Maxime Du Camp provided a meticulous anatomy of a Parisian institution: the *bureau central* of communication on the rue de Grenelle-Saint-Germain.[8] In this "palace of electricity," Morse and Hughes telegraph machines thrummed away at all hours, creating a constant, repetitive din. Yet the fierce modernity of the space and the contemporaneity of its operations existed in the wake of a trail of obsolete technological artifacts and moldering archives of correspondence. The building too, constructed with an earlier, pre-electric form of communication in mind—the Chappe telegraph—accentuated the troubling presence of the outmoded. Optical telegraphy, in Du Camp's reading, haunted the future of telegraphic communication, and the traces of its hardware and administration were still discernible at the *bureau central*, where the utopian promise of telegraphy's initial incarnation remained in the 1870s as reproof to its current formulation. As he wrote,

> This old fortress of telegraphy is stripped of her splendour; she involuntarily makes one think of those medieval castles on which we put wings and which became mills. We removed the Chappe machines that gestured towards the four cardinal

> points; we took away the telescopes that searched the horizon; . . . and in the post office, where all the news of France and the world ended up, we stacked cartons, old registers, piles of paper; the mice walk about in peace, spiders spin their webs unconstrained: *Sic transit!* The central cubicle has become an attic.[9]

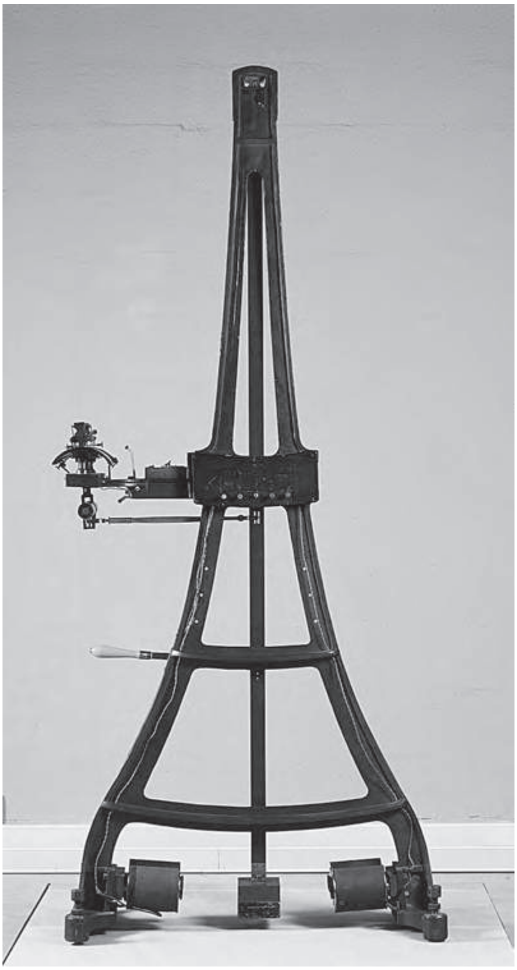
So much for technology's inexorable forward march. Instead, attempts at progress reconfigured the present as a retrofitted Middle Ages, burdened by a jumble of rotten papers. Against this image of decay Du Camp set out a detailed description of the physical, technological, and social organization of the *bureau*, stressing the frantic, poorly remunerated labor that took place there. New technologies of transmission produced detrimental physiological and psychological effects in the people who operated them, who had, Du Camp reported, largely given up on speaking to one another and now conversed solely in code like the "intelligent machines" that surrounded them. At the *bureau central*, "There is not a second of rest, all the nerves are overexcited; the sheer diversity of news which follows relentlessly leads to more weariness: family matters, bank intrigues, commercial operations, political news, coded letters, English, French, Italian, Spanish, Dutch, German, arrive one after the other, like the ticking of a clock, regularly and tirelessly in the space of the same quarter hour. To this we must add the continuous noise of devices, nervous noise, staccato . . . which undermines the most vigorous of natures."[10]

Perhaps to get away from this infernal cacophony, Du Camp retreated to the lower depths of the *bureau*, to the realm of mice and spiders. If the transmission room was dominated by an accelerating, disciplining clock time, here time went backward but was no less configured by established power dynamics. This was where news came that was not meant for "little people like you and me"—the deaths of emperors and kings, revolutions, abdications, peace treaties, declarations of war, assassinations, royal marriages, and princely births—information regarding world-historical events that required extensive mediation before it could be let loose on an unsuspecting public.[11] This archive harbored the secret information intrinsic to the telegraphic enterprise since its systematization in the 1790s, highly sensitive in its day but now of purely historical interest. And here, in a little room on the ground floor, far from the open, cloudless sky necessary to the aerial forerunners for which the building was constructed, lurked four machines that for five years in the 1860s promised to send images through time and space but that, by the time of Du Camp's investigation, had already begun their slide into disrepair and neglect.

Apparitions

These machines were pantelegraphs, the invention of an Italian priest, Giovanni Caselli, registered in 1861 and brought into official service in 1863.[12] "Everyone knows," Du Camp wrote, "that this device, which is electro-chemical, reproduces in *facsimile*

everything that one can draw on paper: a portrait drawn in pen, submitted to the influence of the machine in Lyon, will be photographed, so to speak, by the apparatus in Paris."[13] Whereas Chappe's aerial semaphore operated by visual means and gave rise in turn to an array of visual images that documented its incongruous appearance on rooftops and church towers across France, the pantelegraph's operation did not depend on an operator discerning a visual sign and conveying it to the next outpost.[14] Rather, it offered, for the first time, the miraculous ability to send pictures down a telegraph line. Contained in the dark rooms of the telegraphic *bureau*, the pantelegraph did not figure *as* image but instead gave rise to images of its own making.

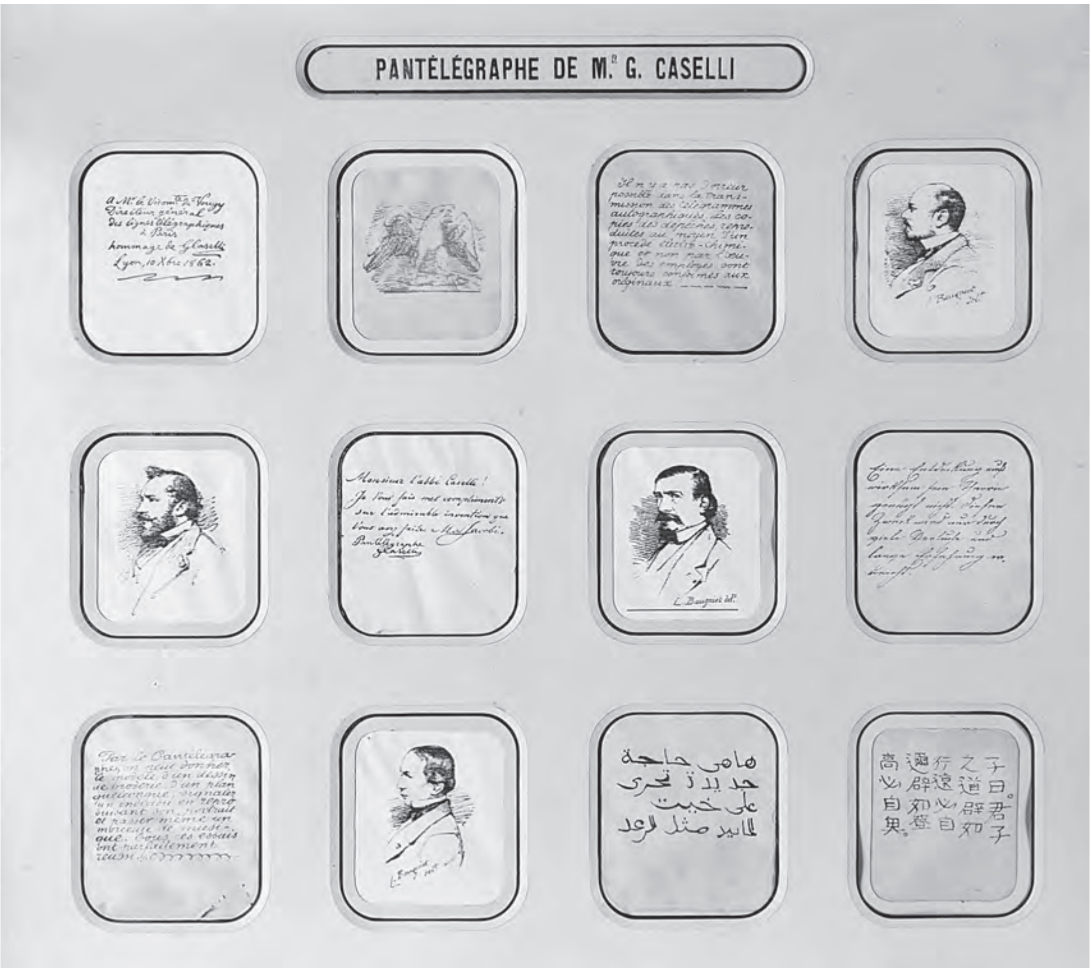


4.3 Giovanni Caselli and Paul Gustave Froment, *Télégraphe autographique système Caselli dit Pantélégraphe*, 1861. Dimensions 215 × 94 × 50 cm. Musée des arts et métiers, Paris.

"Photographed, *so to speak*." Although its images were produced at the point of reception by means of a chemical reaction, Caselli's machine was not truly photographic. The pantelegraph is often described as a forerunner of the fax machine.[15] Yet now that such devices are themselves practically extinct, the association between the pantelegraph and these "modern" forms of communication can no longer be assimilated as assuredly into a narrative of technological progress. Jules Verne may have included a pantelegraph in his vision of a future Paris in his novel *Paris au xxe. siècle*, crediting Caselli with its invention, but no unbroken chain links the pantelegraph to the devices that succeeded it.[16] Nonetheless, the inscriptive functions of the pantelegraph had numerous conceptual and material affinities with other "new media" in the visual ecology of nineteenth-century France, especially photography.[17] Pantelegraphy has tended to be incorporated into a history of telegraphic communication that focuses on the transmission of written characters. How might this all appear differently if we shift the focus to the imagistic potential of the pantelegraph, which was in fact its primary innovation in the minds of many contemporary observers?

The pantelegraph comprised an elegant A-shaped frame, approximately two meters in height, bisected by a heavy pendulum that hung its length (fig. 4.3). The device transmitted messages to an identical machine at the destination, to which it was connected by an electrical cable. On one side of each device, a pair of curved copper plates provided a support for the transmission of dispatches, one to send and one to receive incoming messages. The users drew or wrote their messages in nonconducting ink on a sheet of tin or metallized paper. Clips attached this sheet to one of the curved plates. The swinging pendulum animated a stylus that scanned the message by moving across it in a series of parallel lines, while on the other plate incoming messages were inscribed. One movement of the pendulum corresponded to the movement of one line. Extremely accurate clocks, functioning independently of the electrical current of the telegraphic cable to minimize atmospheric variation, ensured perfect syncopation of the two machines. Each time the stylus passed the nonconducting ink, the signal was broken, enabling an exact replica of the message to be produced at the other end. At the destination apparatus, a sheet of paper impregnated with potassium ferrocyanide was attached to the receiving plate. Those parts of the paper that were subject to an electrical current passing through the stylus were marked in Prussian blue, by virtue of a chemical reaction with the paper (fig. 4.4). Earlier attempts at electrochemical telegraphy—the Davy machine of 1839 or Alexander Bain's device of twelve years later—had been limited to the transmission of figures and preset signs.[18] The pantelegraph was the first device to transmit faithfully other kinds of inscription: portraits, signatures, plans, or in fact any image that could be drawn on the surface of the tin. Over a decade before the implementation of telephone lines, it realized the possibility that images might transcend their rootedness in a single place and time to appear, almost simultaneously, at another location.[19]

It is hard to escape the sense that sending an image so that it might appear in identical form elsewhere would have registered as a crucial moment in the history of mechanical reproduction, as well as announcing a paradigm shift in the history of how we encounter images more generally. Surely it *must* have changed everything? Yet the pantelegraph did not transform inexorably the temporality and authenticity of visual images. In commercial terms, certainly, it failed. Following his arrival in Paris in 1857, Caselli had benefited from the assistance of Paul Gustave Froment, to whom he had been recommended by the renowned physicist Léon Foucault, and the two collaborated together on the design of the pantelegraph. The invention was the subject of much interest in the French scientific community and was initially a success, attracting the support of Napoleon III, who encouraged Caselli to use the Parisian telegraph lines to conduct his experiments. In 1863, Caselli received authorization for the commercial exploitation of a line from Paris to Marseille and also experimented with a pantelegraph line between London and Liverpool. However, within a decade, the pantelegraph had ceased to operate. It never achieved a sufficient number of users, and did not survive the traumatic events of 1870–71.[20]



4.4 *Tableau présentant des manuscrits et dessins obtenus avec le télégraphe autographique dit pantélégraphe de Caselli*, 1861. Dimensions 73 × 78 cm. Musée des arts et métiers, Paris.

Poorly supported by the "Société anonyme du télégraphe pantographique Caselli" set up to market the invention, the pantelegraph was introduced at a difficult moment in the aftermath of the shift from the Chappe system and the abolition of a state monopoly on telegraphic transmission. Telegraphic companies charged higher prices for handwritten messages, and laws introduced to appease powerful interests threatened by the transition away from state control compromised the system. These laws were particularly hostile to the visual dimension of pantelegraphy. They required that all messages be sent in an intelligible language and include the signature of the sender, and in apprehension of the possible seditious uses to which telegraphy might be put, they did not respond favorably to a device that could send maps, drawings, or coded messages. Finally, although one of the pantelegraph's key uses was the transmission of signatures for banking purposes, Morse code already provided an effective means

of sending figures, and the expense ultimately proved prohibitive.[21] The device was picked up in China and used to transmit idiographic characters (two Chinese emissaries visited Froment's lab as early as 1863), although an attempt in 1884 to export the pantelegraph from Italy to China broke down.[22]

Yet the pantelegraph's magical inscriptions did not go unnoticed. As early as 1858, announcing Caselli's invention of the "Télégraphe photographique" in *La Lumière*, the critic La Gavinie claimed that "the day is near when one will be able to write from one hemisphere to the other and communicate one's feelings, just as if one spoke to the ear. Everyone at one end of the telegraph line will be able to share confidences or exchange his portrait."[23] La Gavinie predicted the future course the technology would take and anticipated that Caselli's machine would prove particularly damaging to French notaries, whose income would be challenged by the machine's intermediary function, as anyone might sign a deed or certificate, from Paris to New York, London to Peking, without needing to be present.[24] The journalist took from an earlier report in *Le Magasin pittoresque* some basic information about the operation of the pantelegraph, including the claim that "to transmit by means of electricity, in an instant, to a great distance, one's own portrait, or that of people with whom one finds oneself, or the view of the property where one lives, would surely be one of the finest applications of the combined findings of the electric telegraph and photography."[25] Pantelegraphy's present was avowedly visual and commercial, fusing personal identity and land ownership, and its future was photographic.

Even many years after its demise, the device still carried significant metaphorical currency. In Gabriel Delanne's 1909 *Apparitions matérialisées des vivants et des morts*, the specter of pantelegraphy was harnessed to the study of apparitions from beyond the grave, as well as to the manipulation of the living. Delanne described how a "community of sensation" might allow for the transmission of images and impressions between an operator (an interestingly telegraphic locution) and the somnabulist subject.[26] Via a mysterious process of magnetism and by way of autosuggestion, a wound made to a photographic image might manifest as stigmata on the skin of the person represented in the photograph. By the early twentieth century, the pantelegraph as functioning apparatus was already a distant memory, but it continued to "offer an analogy for this phenomenon, because we know that thanks to an ingenious device, all trace left on the departure apparatus is reproduced automatically on the receiving apparatus located in the distance, electricity connecting each point of the two surfaces at a determined time."[27] Delanne recounted an experiment that took place in Nadar's studio in front of several medical practitioners, whereby a certain Mme. O, under hypnosis, was sent to sleep, then awakened by exposure to a photographic portrait taken while under the influence, an image that, unbeknownst to her, had been superimposed with an identically sized photograph of the right hand of the operator. According to M. de Rochas, who recounted this story, the image of the operator's hand communicated the vibrations produced by hypnosis to the image of Mme. O, which, serving simply as a relay, transmitted them

to Mme. O herself. When the time came, Mme. O could be woken up by blowing on the photograph.[28]

As these accounts demonstrate, right from the beginning pantelegraphy was considered in tandem with photography and later incorporated into accounts of its development, occupying a conceptual, if not strictly technical, middle ground between the image drawn by the human hand and photography's "pencil of nature." As Simone Natale has observed, Daguerre's innovation coincided with the opening of early electric lines and Samuel Morse's interest in photography, while, subsequent to the demise of the pantelegraph, Willoughby Smith's 1873 discovery of the photosensitive qualities of crystalline selenium made photographic transmission down telegraph lines—in discussion since Becquerel's experiments in the late 1830s—a near possibility.[29] Yet the connection between photography and telegraphy was not formed by a concurrence between the "inventions" of either technology, for embedded within this relationship were memories of earlier developments and long-standing practices in both fields. By the 1896 edition of Frédéric Dillaye's *Les nouveautés photographiques,* a lengthy section on the history of *phototélégraphie* paid particular attention to Caselli's machine, which was attached posthumously to a longer history of photographic transmission.[30] Such narratives, which were predominantly technical in character, were preoccupied with affirming the successful progress of the medium of photography. However, four years after the publication of Dillaye's account, a more oblique, historically nuanced response appeared in a text now taken to be a foundational, if somewhat eccentric, contribution to the history of photography. For the author of this text, photography's history belonged as much to the history of telegraphy as the other way around.

In Transit in the City

Nadar's *Quand j'étais photographe* was published in 1900, toward the end of his life. Although Nadar had moved away from photography to focus on other scientific pursuits, he was still active in the medium. Noting the title's strangeness, Rosalind Krauss observes that "Nadar's past tense has less to do with his personal fortunes and the trajectory of his own career through time, than with his status as witness."[31] Crucial, for Nadar, was photography's unique transformation of the world, and he stresses the extent to which it had surpassed the achievements of "the Laplaces and the Montgolfiers, the Lavoisiers, the Chappes, the Contés, all of them."[32] In an early section of this text, Nadar presents a strange fantasy of image transmission, which not only references explicitly the telegraphic transmission of images but seems to consider telegraphs more generally—and, remarkably, pantelegraphy in particular—as a form of historical comprehension.

Nadar begins his story by describing a strange correspondence that took place in the autumn of 1856. A café owner named Gazebon had written to Nadar, telling him of his recent encounter with a M. Mauclerc, "an actor in transit in our city."[33]

Mauclerc had convinced Gazebon that he had in his possession a daguerreotype portrait of himself that Nadar had allegedly taken "by the electric process" while the photographer was in Paris and Mauclerc in Eaux-Bonnes, near the border with Spain. Although Mauclerc was disbelieved by some, Gazebon remained certain of the actor's credibility, having "dabbled in the process" himself.[34] Gazebon thus requested that Nadar photograph him at Pau—preferably in color, while seated at a table in his *salle de billards*—with the promise that he would soon put some business his way. Gazebon's name rang a bell: Nadar recalled that Gazebon had contacted him two years previously, also at Mauclerc's instigation, regarding a gilded copper engraving—"a masterpiece of Restoration bad taste"—that Mauclerc had assured him was highly valuable.[35] Mauclerc had persuaded Gazebon that this engraving was a collector's item whose only other copy was, strangely enough, in the possession of Nadar. Nadar, disconcerted by their author's persistence, ignored both letters, writing off Mauclerc as a crook and Gazebon as a gullible fool. He hung on to the correspondence, though, for "it is not unpleasant and it is legitimate, in the last days of a long and sufficiently fulfilling career, to have received and to reread letters such as this one."[36]

Some twenty years later, while relaxing with his friend Hérald de Pages, Nadar was visited unexpectedly by a young man, a nineteen-year-old electrician from Clignancourt whose mother had allegedly been in service for Nadar's mother in Lyon. Pushing for an audience with the famous photographer, the visitor eventually wheedled his way in. He began by relaying his career to date: having already worked in Breguet's workshop, the young man had subsequently apprenticed with Trouvé while he was developing his dual-motored electric velocipede, with Froment as he perfected his electric chronometers, with Marcel Desprez on his generator, and with Ader on his telephone. Each of these scientists was duly acknowledged for the magnitude of his achievements. Pride of place in this glittering vita, however, went to an invention that by the time Nadar was writing had long fallen into disuse: "I was even lucky enough to be accepted by M. Caselli to work on his autographic telegraphy. That is where, especially . . ."[37]

That is where . . . what? Transmission interrupted. An assumedly heartfelt evocation of the excellence of the invention and of the young man's memory of his career as a pantelegrapher was curtailed, for at this point, interrupted in the telling of his story, he moved, cautiously, to the subject of his visit, which was no less than the possibility of long-distance photography. Claiming to have developed a new technique, the mysterious visitor asked Nadar to grant him the opportunity to demonstrate his invention, asking that he commission one of his technicians to take, "in the isolated conditions indicated or that you will suggest yourself, with whatever model you choose," a photograph to prove or disprove his claim.[38] Nadar, as if already anticipating being photographed from afar, froze stock-still: "I did not move a muscle."[39] De Pages, on the other hand, was more effusive. "Do you hope to be able to take photographs from all distances, and out of sight?" he demanded. "I do not hope to be able to do it, sir," responded the young man, "I already do it. But I don't know how else to explain it

to you, and you will see the rest yourself: I am not an inventor, I haven't invented anything; I have only encountered something that was always there."[40]

Admitting to the two men that he had already demonstrated his invention, the visitor showed them—with a performative flourish—a cutting from "an ordinary *Courrier* or Écho de la Banlieue" that documented his successful attempt to photograph, from Montmartre, the town of Deuil, near Montmorency.[41] The man's appeal found a receptive audience, for it happened that the day before this encounter, Nadar and de Pages had visited the International Exposition of Electricity, where they had marveled at the exhibits yet remained troubled slightly by the "diabolical servant" promised by the technological future, which Nadar recounted in a memorable passage:

> This all-powerful and impeccable agent, this servant unrivalled in all its liveries and all its names: telegraph, polyscope, phonophone, phonograph, phonautograph, telelogue, telephone, topophone, spectrophone, microphone, sphygmograph, pyrophone, etc., etc. We have seen it lifting and transporting our burdens for us, propelling our ships, our carriages, carrying our voice from region to region and storing sound, *ne variatur*, up to its least perceptible modulations, writing, drawing far beyond the reach of the hand, at all distances . . . indicating to the surgeon the bullet lodged in our body, stopping our galloping horses or our locomotives dead in their tracks, and also arresting thieves, plowing our soil, winnowing our wheat, improving and aging our wine, and shooting game for us, monitoring our cashiers while guarding our cashboxes. . . . A first-class worker, in all the arts and professions, and good at everything, one at a time or all at once as you wish, market porter, postman, lampman, engraver, farmer, doctor, artilleryman, bookkeeper, archivist, carpenter, stand-in soldier, tenor, and policeman. . . . In fact, why not photographer, this universal Jack-of-all-trades, and even long-distance photographer?[42]

As Stephen Bann has noted, despite Nadar's fascination with the social and ontological implications of technological novelty, his scientific approach was eclectic, and he was averse to triumphalist narratives of photographic exceptionalism.[43] Indeed, his vision of technological supremacy bears a semblance to Du Camp's dystopian account of telegraphic workers, their minds and bodies bound in servitude to an incessant stream of everyday and official information. This is technology as regulating device—"monitoring the cashier while guarding the cashbox"—in the service of capital. Nadar's description represents technology, with telegraphy in a lead role, as both suprahuman and subhuman, operating above the level of our own capacities and at the same time beneath contempt. The trope of machines as servants was, of course, hardly a new one at the turn of the twentieth century, yet telegraphic workers had, since the introduction of the Chappe system, been considered particularly emblematic figures in this regard. The mechanism of the Chappe telegraph required that its operators replicate in miniature, by manipulating small handles, the same maneuvers as the

signal arms they controlled. They were thus viewed as inseparable from the apparatuses themselves. "Living chrysalises," Alexandre Dumas termed them in the *Count of Monte Cristo*, "poor wretch[es]," "genii, sylphs, gnomes," "fagged to death with cabals, factions and government intrigues," their monotonous lives wasted watching a "white-bellied, black-clawed fellow insect, four or five leagues distant."[44]

At this point in his account, Nadar succumbed to a strange hallucination, an optical illusion in which his friend de Pages's features merged with those of the young visitor, revealing "a kind of diabolical mask which slowly took on the form of a face I had never seen before but that I recognized immediately: Mauclerc, Machiavellian Mauclerc, 'in transit in our city'; the electric image mockingly reared its head at me from the land of Henri IV."[45] As if in one of Francis Galton's composite photographs, superimposition of features revealed a criminal "type" that transcended location in a particular time and place, recalling too the autosuggestive images of Mme. O produced in Nadar's studio. However, it also pointed to ways of tracking information across time that were not unique to photography. Nadar's hallucination was a photographic effect, certainly, but rather than alluding solely to the temporal consequences of photography, it was grounded in the shared histories of photography and telegraphy.

The mechanics of the young man's proposed method were somewhat shady. The visitor stressed that no connecting wires were necessary, for the machine depended on the conducting properties of air alone. Having relieved an ironically amused Nadar of two louis d'or, the young man left, swearing to return twelve days later. Although the story is not resolved fully, we are left to assume that this never happened, that the two men had been scammed, albeit knowingly, by a consummate racketeer, and that the ghost of Mauclerc continued to stalk the streets. Pushed by de Pages as to whether he still denied the feasibility of long-distance photography, Nadar affirmed his agnosticism, refusing to deny or confirm the possibility. Two addenda to the section bring the story right up to date. A first postscript notes the recent work on precisely this technical question by Dr. Ed. Liesegang of Vienna, citing an article in the *British Journal of Photography* "which finally discredits Mauclerc to the greatest glory of Gazebon, who is rehabilated." A final P.P.S. is even more adamant, asserting a contemporaneity that not only surpasses the long-ago story of Mauclerc and Gazebon, but exceeds even its later recounting, making sure that readers are in no doubt that the text occupies the time of the now: "P.P.S. And from this very morning, with the definitive success of Marconi's wireless telegraphy, what can we not dream of?" Nadar signs off, finally, "Marseille, June '99."[46]

When Nadar was a photographer, he tells us, the mysterious young con man who called upon him was a telegrapher. Telegraphy, like photography, walked a fine line between truth and falsehood, fraud and sincerity. Yet Nadar's visitor in *Quand j'étais photographe* was not an oppressed telegraphic worker, or even a sublimated form thereof. Rather, in his humble work shirt, he carried the brio of the impetuous, creative inventor, despite his contrary claim that he was repeating preexisting innovations, including those of Nadar himself. Caselli's device, after all, was (like

photography) commonly artistic in tone, if often bureaucratic in application (again, like photography), and as Du Camp had observed, it occupied a different conceptual and physical space than the massed ranks of telegraph operators at the *bureau central*. Nadar encounters this young man, if not as an equal, then as a fellow traveler, although he also operates as a cipher for significant changes in both media, a transitional figure between pantelegraphy and Marconi's success. For Krauss, Nadar's skepticism was another iteration of his conviction that "photography can only operate with the directness of a physical graft."[47] Yet the text unfolds over a long time, bringing together a half-forgotten exchange from 1856 with a story from the 1880s and its telling in 1899. Nadar's P.P.S. regarding Marconi challenges his own disbelief, affirming the subtly dialectical quality of his approach, for while pantelegraphy may have "failed" where photography transparently "succeeded," photography's future now looked likely to be realized by telegraphic means, reanimating Caselli's long-moribund project in the process.

As Bann has described, *Quand j'étais photographe* is not only one of the first attempts by a contemporary practitioner to document the history of photography's early industrial forms; it demonstrates too Nadar's particularly self-aware understanding of the relationship between images and history.[48] This is a relationship that extends into the future, for the conceptual attraction of the story is, Bann contends, an affinity between long-distance photography and "what we now banally term 'television.'"[49] Nonetheless, "the moment has not yet come," for Nadar seems to articulate something that has not yet transpired and will not for some years.[50] But is it "Nadar"—that curious confection of self and other in the photographer's memoir-story—who does this? Or is it rather the strange visitor, with his tall tale of previous work on Caselli's machine, who ventriloquizes for Nadar photography's displacement of bodies in space? Nadar's narrative betrays the extent to which the early history of photography was bound up with the ways in which it might be transmitted. The pantelegraph provided a language with which to understand something that had attended photography since its earliest days: the dream, and sometimes nightmare, of an image that might move seamlessly from one place to another. Collapsing the durational and spatial aspects of the new medium, this itinerant image was tied to the mobility of Mauclerc (in transit in our city) but also to the mobility of objects themselves in time (Du Camp's *sic transit*).

In *Charles Baudelaire intime: Le poète vierge*, published posthumously in 1911, Nadar describes a surprising meeting in the late 1830s with "a strange, ghostly figure" whom he encountered on a walk through Paris with the writer and journalist Alexandre Privat d'Anglemont. When Nadar and Privat were able to identify this "apparition," they saw it was none other than Baudelaire.[51] Nadar gives the following description of his friend: "Assisted by the black of the costume, the restrained, meticulous, crushed gesture recalled the successive silhouettes of the optical telegraph which was then being taken apart on the towers of Saint-Sulpice or, better, the angular gymnastics of a spider in wet weather after her thread. The relationship with our new friend was

4.5 Nadar (Gaspard-Félix Tournachon), *Charles Baudelaire*, 1854–60. Albumen print on paper pasted on card, 8.5 × 9 cm. Bibliothèque nationale de France, Paris.

already complete, despite his reserve, because things happened in this way then, long before the electricities of M. Edison."[52] Striking, in this account, is the attention Nadar pays, not only to Baudelaire's physical similarity to a Chappe telegraph, but to its destruction. Baudelaire's body is framed in terms of an interregnum between the dismantling of the optical telegraph on Saint-Sulpice and the new speed of human connection forged by Edison's electric marvels. This motif situates Nadar's recollection in a particular time and place, the Paris of the 1830s and 1840s—a period to which he returned frequently in his writings. Baudelaire *intime*, Baudelaire in time. Death is always already encoded in this description, which appeared in print after the passing of both men and invoked, by association, photography's much commented upon ability to mediate past lives. More importantly, however, Nadar uses the time of telegraphy to calibrate and comprehend this past.

Much of the discourse on telegraphy's relationship to both contemporaneous and "new" media has focused on its electric forms, particularly those that achieved some measure of longevity, aligning them either explicitly or implicitly with a future path sometimes understood in overly deterministic terms. Yet the telegraphs with which Nadar punctuated his writing on photography had been mostly outmoded for some time—the Chappe system ceased to operate the year before Nadar's first correspondence from Gazebon—and even his references to technology from the last twenty years recalled its former, obsolete iterations. At one level, telegraphy seemed to provide a useful framing device because of its endurance as a practice and its continuing relevance, a stable marker against which photography's progress might be measured. Yet while for Nadar the time of photography was informed by the many other devices that accompanied its introduction, such as the pantelegraph, through these associations he also offered a reminder that telegraphy, like photography, offered a means to think about the past in its complex relationship to the present and future. To

speak of current forms of telegraphic communication—and photography too, for that matter—was to invoke a shared technological genealogy that included the past time of telegraphy's visual world, from Caselli's little blue drawings to Chappe's network of semaphoric relays, materialized in the body of Baudelaire and captured repeatedly by Nadar's camera, his damp-spider-telegraph arm folded in his jacket (fig. 4.5).

Notes

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1. Ludwig Börne quoted in Fritzsche, *Stranded in the Present*, 51.
2. See Roberts, "Post-Telegraphic Pictures."
3. See *La télégraphie Chappe*. See also Chappe, *Histoire de la Télégraphie*.
4. Field, "French Optical Telegraphy."
5. See Lakanal, *Rapport sur le télégraphe*.
6. Cobb, *Paris and Its Provinces*, 104–5.
7. For a compelling analysis of this image, see Lerner, "Nadar's Signatures."
8. Du Camp, *Paris*.
9. Ibid., 136.
10. Ibid., 140.
11. Ibid., 148.
12. See Biblioteca comunale degli Intronati, Siena, BCI P.1/2, 1, 2, 3; BCI GDS Ritratti Porri. 2332; and R.VI.37.
13. Du Camp, *Paris*, 148.
14. See Taws, "Telegraphic Images," 400–421.
15. Pucci, "La transmission par fac-similé."
16. Verne, *Paris in the Twentieth Century*, 53.
17. See Gitelman, *Scripts, Grooves, and Writing Machines*, 1–20.
18. Dillaye, *Les nouveautés photographique*, 208–10.
19. On simultaneous time, see Galison, *Einstein's Clocks*.
20. Nosengo, *L'extinction des technosaures*, 120–38.
21. Ibid., 126. A pantelegraphic message cost six francs to send. See also Preda, "Les hommes de la bourse et leurs instruments merveilleux."
22. Feydy, "Le pantélégraphe de Caselli."
23. *La Lumière*, September 4, 1858, 143.
24. Ibid.
25. Ibid.
26. Delanne, *Apparitions matérialisées*, 373–75.
27. Ibid., 375.
28. Ibid., 375–76.
29. Natale, "Photography and Communication Media." See also Baker, *The Telegraphic Transmission of Photographs*, and Batchen, "Electricity Made Visible."
30. Dillaye, *Les nouveautés photographique*, 210–14.
31. Krauss, "Tracing Nadar."
32. Nadar, *Quand j'étais photographe*, 3–4.
33. Ibid., 9.
34. Ibid.
35. Ibid., 11.
36. Ibid., 12.
37. Ibid., 16–17.
38. Ibid., 19–20.
39. Ibid., 20.
40. Ibid., 20–21.
41. Ibid., 21.
42. Ibid., 23–24. The first International Exposition of Electricity, to which Nadar likely referred, took place at the Palais de l'Industrie in autumn 1881 on the initiative of Adolphe Cochery, minister of posts and telegraphs.
43. Bann, "'When I Was a Photographer,'" 107.
44. Dumas, *The Count of Monte Cristo*, 78. See also Bell, *Real Time*, 76–130, and Siegert, *Relays*, 165–85.
45. Nadar, *Quand j'étais photographe*, 25.
46. Ibid., 35.
47. Krauss, "Tracing Nadar," 33.
48. Bann, "'When I Was a Photographer.'"
49. Ibid., 111.
50. Ibid.
51. Nadar, *Charles Baudelaire*, 36.
52. Ibid.

{ 5. }

With Eyes of Flesh and Glass Eyes

Railroad Image-Objects and Fantasies of Human-Machine Hybridizations in the Mid-Nineteenth-Century United States

NICOLETTA LEONARDI

From its inception in the 1820s, the development of the railroad in the United States was fast and steady. By 1890, 193,000 miles of rail tracks were opened to traffic, about as much as the rest of the world combined.[1] At a time when immense private and public sums were invested in the railroad, when tourism was boosted by this new means of transportation, when competition among companies was harsh, and when incidents along the lines occurred, entrepreneurs were anxious to promote their industry. Accordingly, they often hired painters, engravers, and photographers to produce images in which the railroad was presented as an indispensable tool for the national cult of nature, which allowed vast numbers of people to reach remote locations for landscape contemplation comfortably and safely in a reasonably short time and at an affordable cost. Furthermore, artists were hired to paint scenes on the interior and exterior of passengers' coaches and locomotives with motifs drawn from picturesque iconography, to adorn steam engines with landscape scenes on their headlamps and coal cars, as well as to design and decorate the stations.[2]

Drawing its methodology from the so-called material turn in the humanities, this chapter offers an analysis of the visual economy of railroad landscape representation and reception in the United States at mid-nineteenth century.[3] By taking as objects of inquiry paintings, photographs, and prints commissioned by railroad companies, along with tourist books and the illustrated press, and by focusing on the processes of production, circulation, and consumption of serialized image-objects, I propose

a new understanding of representational practices and discourses pertaining to landscape not simply as an artistic genre but as a medium and a vast network of cultural codes. My aim is to show that both an autonomous history of photography and an autonomous art history offer inadequate approaches for a thorough understanding of image-objects circulating across the society and observational rhetorics of the period and that a dialogue between these disciplines and media history is much needed.

First, I look at how paintings, prints, and photographs moved across social, regional, national, and international boundaries. Depicting railroads harmoniously nestled into pastoral landscapes, this wide range of image-objects structured and reproduced cultural sentiments and aesthetic dispositions about U.S. nationhood at home and abroad, contributing to the visual economy of the so-called American technological sublime.[4] Taking as an example a promotional train jaunt organized in 1858 by the Baltimore and Ohio (B&O) Railroad, I then discuss how, besides contemplating the machine in a pastoral setting, another aspect of landscape culture was that of looking at nature *through* machines: the train coach, the photographic camera. This landscape mode offered the viewer the possibility of moving through the panoramic landscape by ways of a series of replicable and repeatable visual experiences in which the camera, the train, and the observer's eye appeared as bound together in a single entity: a viewing subject resulting from a fantasy of hybridization of the human and the machine. Lastly, I investigate the connections between the fantasies of a hybridized human/machine viewer functioning like an optical device and the practices of immersive viewing typical of panorama and diorama spectacles.

Railroad Image-Objects and the Visual Economy of the Technological Sublime

Several writers have claimed that the first known appearance of the railroad in American highbrow painting is Thomas Cole's *River in the Catskills* (1843).[5] The canvas is one of at least ten versions of a view looking west from the town of Catskill toward the Catskill Mountains that the artist produced between 1827 and 1843 for the art market that developed in conjunction with the rise of tourism in the region. It depicts the figure of a man contemplating a landscape setting in which a train is integrated into the classic pastoral formula. Surrounded by tree trunks where once there was wilderness, he is holding an axe in his hand, a symbol of change in nature and a standard iconographic theme for many railroad landscapes. Despite this clear reference to the damage produced by the advance of civilization, the railroad is not represented as a menace to the beauty of landscape. Quite on the contrary, the train appears as a small and undisturbing element in the middle ground, indicating a compatibility of nature and technology. By 1845, the painting was in the collection of New York lawyer George F. Allen, a railroad and steamship lines entrepreneur.

As noted by Leo Marx and Susan Danly, *River in the Catskills* is part of a vast iconographic tradition in which the image of nature as wilderness coexists with the

image of nature as a pastoral garden that includes the benign presence of technology.[6] In analyzing this painting, as well as other works by Cole, art historians such as Angela Miller and Alan Wallach have questioned this reading, pointing to Cole's personal negative views of technological progress. Although some scattered voices of criticism toward this interpretation have been raised, the idea of Cole's work as "antipastoral" is still widely accepted today.[7] Yet the exclusive use of authorial intent as an interpretational framework is not enough when dealing with cultural artifacts produced at a time of industrialization, media explosion, and the commodification of images. At the dawn of modern media culture, highbrow and popular-culture authors acted as *both* producers and recipients of the shared conventions and iconographies that, in the specific case of the United States, gave voice to a set of collective myths based on the notion of America as a technological Arcadia.

Cole's patrons were a generation of newly rich urban industrialists, bankers, merchants, and transportation entrepreneurs. More than reflecting his own beliefs, his paintings, as well as those of other artists working for the same people, were aimed at conveying these businessmen's ideas about progress, along with reflecting their social prestige. Asher Brown Durand's *Progress (The Advance of Civilization)*, commissioned in 1853 by Charles Gould, a New York broker and treasurer of the Ohio and Mississippi Railroad, is another of several examples of this cultural trend. The painting depicts Native Americans looking at a scene of progress in which roads for the transportation of people, merchandise, and agricultural products merge with the railway and the telegraphic lines in a movement from nature toward the industrialized city. This iconography implies a stadial concept of history based on recurrent patterns and cycles of progress and regress. Following the stadialist theories of Enlightenment philosophers and historians and taking the examples of the Roman Republic and Empire and the British Empire, popular U.S. historians such as George Bancroft theorized that every civilization would progress from savage state to pastoral state to agricultural state and would reach its apogee with the commercial and manufacturing state.[8] After this climax, it would inevitably become corrupted due to its excessive wealth. The virtue of its citizens would be corroded and decay and tyranny would follow, until barbarian invasions would bring the civilization to ruins. Yet, as Durand's painting seems to indicate, the United States would differentiate itself from the corrupt Roman and British empires. As predicated by American pastoral ideology, in the New World, past and present would coexist within the same spatial setting, and the reserves of uncontaminated nature—far from being destroyed by progress and civilization—could peacefully exist side by side with the cultivated garden as well as the industrialized city.[9]

Like Cole, who painted the same Catskills views over and over again because of their ready marketability, highbrow painters commonly depicted famous tourist locations repeatedly in different formats and marketed them at a variety of prices. That is, just like photographers and engravers, painters worked *serially*, often producing multiple almost identical versions of the same scene over and over again to satisfy the demand coming from collectors—who did not seem particularly interested in

5.1 After Jasper F. Cropsey, *An American Autumn, Starucca Valley, Erie R. Road*. Chromolithograph on paper by William Dreser, published by Thomas Sinclair for the Crosby Opera House Association, 1865. Image: 39.5 × 67.6 cm; sheet: 48.9 × 69.2 cm.

acquiring unique and original objects. Conceiving paintings as some sort of multiples, these buyers took pride in hanging in their parlors shared icons that would easily convey their social status and entrepreneurial mission, as well as their sense of national belonging. Within a self-contained art history mostly preoccupied with authorship, style, and uniqueness, these aspects have not so far been sufficiently analyzed. A cross-disciplinary approach is needed in order to come to terms with the complex processes of production, circulation, and consumption of U.S. landscape images and imaginings within the nineteenth-century regional, national, and translational networks of visual and print communication.[10]

Besides the pictures hanging in the private galleries of entrepreneurs, landscape paintings, photographs, and prints depicting trains within picturesque sceneries or landscape "postcards" of views from the train's travels were commissioned by the railroad companies. While the paintings were used to decorate the companies' offices and train stations, prints and photographs were distributed for free or sold at ticket offices and through the postal service, whose expansion was in turn linked to steamships and railroads. Moreover, popular railroad paintings were reproduced as engravings, lithographs, and chromolithographs for large-scale distribution not only through the

railroad companies themselves but also through publishers and, in some cases, through lotteries organized by art unions, where they were used as advertisements for the valuable canvases offered as jackpot prizes, triggers for the public passion for luck, chance, and gambling.[11]

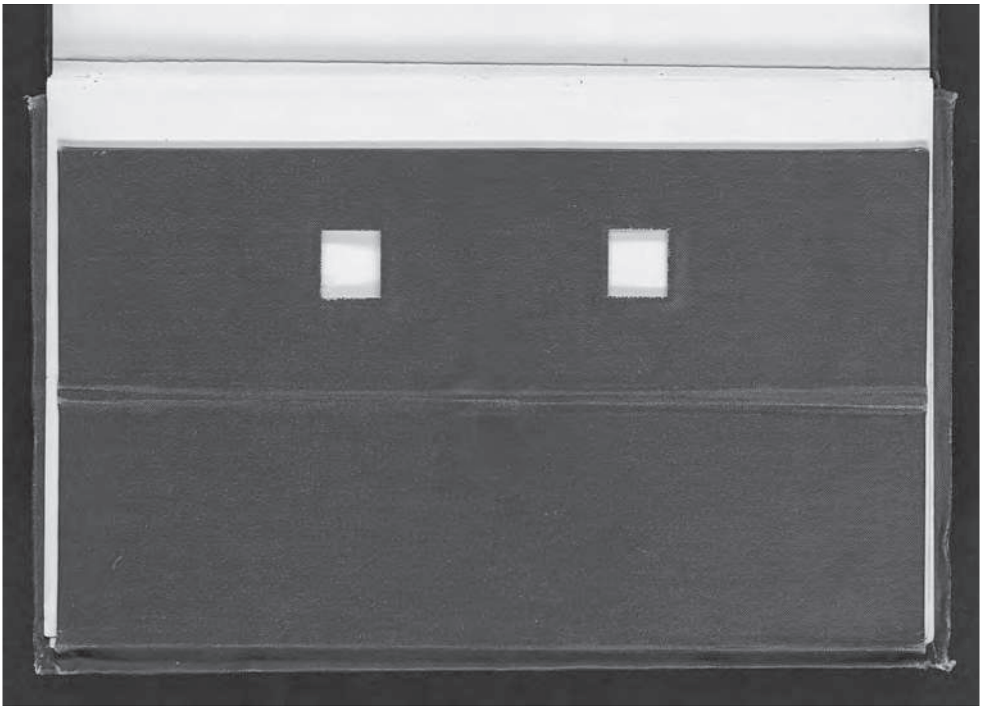
Photographs had a crucial role within this network of communication.[12] The guide to the White Mountains by professional photographers Edward and Charles Bierstadt, published in two editions (1862 and 1875), is an emblematic example of the parallels between the railroad, tourism, and the contemplation of landscape through the photographic format that enjoyed the greatest popularity throughout the nineteenth century: the stereoscope and its stereoviews.[13] The two books were stereoscopic travel guides to be carried along on excursions in the White Mountains, reached by the railroad in 1851. Both were illustrated with stereographs that Edward and Charles Bierstadt shot in collaboration with their renowned brother, landscape painter Albert Bierstadt. Both contained in their book-jacket flaps a folding stereoscope for three-dimensional viewing. The stereo views adhered to each page and were accompanied by descriptive texts. An introductory statement provided precise instructions for proper viewing and explained the novelty as well as the advantages of the multifunctional pocket format chosen for the publication:

> The Stereoscope presents to the eye all the objects in solid relief, as perfectly as if the landscape itself were spread out before it; but the instruments for viewing such pictures are generally too cumbrous for transportation without extra trouble, and the pictures themselves are not in a form suited to the wants of the tourist. In preparing this little volume, it has been our aim to furnish about four dozen Stereoscopic Photographs, so that they should not, with the accompanying Stereoscope, occupy more space than one dozen views, as they are usually made at a price within the reach of all. In this we have succeeded. If the views of New Hampshire scenery thus presented meet the desire to which we have alluded, we hope to find inducements for the publication of similar works of other scenery.[14]

The diverse serialized railroad image-objects I have thus far described were part of a widespread industry of tourism and entertainment. Moving across the nation and through the confines of regional and class divisions, they reached thousands of people and acted upon their imaginings, shaping the visual economy of the American technological sublime.

Fantasies of Human-Machine Hybridizations: The Baltimore and Ohio 1858 Artists' Excursion

In addition to using images for promotion and publicity, railroad companies organized triumphant festive events celebrating the opening of new lines, technological



5.2 "View from the Gate of the Notch," from *Gems of American Scenery, Consisting of Stereoscopic Views Among the White Mountains* (New York: Harroun and Bierstadt, [ca. 1878]), collotypes with letterpress and stereoscopic viewer built into the book's cover. Yale Center for British Art, Paul Mellon Collection.

innovations, and other breakthroughs. Attended by politicians, industrialists, and journalists, these events often had a gala atmosphere and included speeches, musical performances, and pageants. The celebrations were also held on the trains, through promotional jaunts attended by dignitaries, magazine reporters, and artists, who were entertained with good food and amusements of all sorts while being introduced to the grandeur of the wilderness made available by a triumphant technology perfectly nestled into the picturesque scenery.

In 1858, William Prescott Smith, the Baltimore and Ohio Railroad's master of transportation who was in charge of the company's public relations, organized the first known jaunt explicitly dedicated to artists: a five-day promotional tour along the line running westward from Baltimore to Wheeling, in what is today West Virginia. Painters, photographers, and writers were invited on the special train, stopping where they pleased for sketches, photographic views, and notes. Among them were well-known landscape, genre scene, portrait, and historical painters, including John Frederick Kensett (a longtime railroad investor himself), Thomas Rossiter, Thomas Hicks, Francis Blackwell Mayer, Louis Rémy Mignot, Regis Francis Gignoux, William Louis Lang, James Augustus Suydam, James Henry Beard, Joseph Alexander Ames, and John Whetton Ehninger. John R. Johnston, a portrait, landscape, and scenic painter who worked primarily with transparencies, allegories, panoramas, photo coloring, and retouching, was also invited, along with lawyer, poet, and song lyricist William Whiteman Fosdick and popular magazine illustrator and writer David Hunter Strother (known by his pseudonym, Porte Crayon). Also listed among the artists on board were amateur photographers William E. Bartlett, George Washington Dobbin, and Constant Guillou, first president of the Photographic Society of Philadelphia, along with D.C. professional photographer Robert O'Neill. British magician Robert Heller and hymn music composer Richard Storrs Willis completed the group.[15]

Each of these individuals was, in different ways, connected to the railroad, to tourism, to the illustrated press, to the art market and the wide circulation of prints, and to the industry of entertainment. They were invited by the B&O with the purpose of producing images, sounds, and narratives that would convey a precise message: that the important railway link to the central route built by the company was worthy of the patronage of the American people. The key advantages to be stressed were the picturesqueness and grandeur of the new scenery introduced by the railroad to tourists and to wilderness lovers, its daring engineering triumphs, and the unparalleled comfortable travel experience offered to passengers.[16] Besides artists, among the passengers were railroad officials and investors, bankers, politicians, and journalists. The B&O railroad was represented by chief engineer Benjamin H. Latrobe and master of transportation William Prescott Smith, in charge of company's "aesthetic and social department."[17] Railway entrepreneurs, businessmen, and art patrons aboard were Charles Gould, treasurer of the Ohio and Mississippi Railroad; John H. Gourlie, president of the New York Stock Exchange; civil engineer Fairman Rogers; and Baltimore judge Robert

Gilmor Jr. Participating members of the press were painter Asher B. Durand's son John Durand, co-owner and coeditor of the widely distributed arts and literature magazine *The Crayon*; William S. Thayer, a poet, writer, and assistant editor of the *New York Evening Post*; and the founding editor of the *New York Times*, Henry J. Raymond.[18]

The B&O artists' excursion, as well as similar antebellum events, have so far received attention within histories of American art primarily as examples of the romanticized attitude toward the railroad conveyed by the period's machine aesthetic and its relationship with picturesque iconography.[19] Yet the excursion testifies to the fact that, besides the theme of the placid contemplation of machines within a pastoral setting, the practice of looking at the landscape *through* machines was another major aspect of nineteenth-century U.S. landscape culture. As technologies displaced nature as the prevalent mode of experiencing the sublime, they also enabled machines to take the place of bodies.

The most vivid recount of the excursion is David Hunter Strother's feature article, illustrated with twenty-five engravings after drawings by the artist, published in *Harper's New Monthly Magazine* in June 1859 under the pseudonym Porte Crayon.[20] After making some patriotic claims about the birth and ancestry of steam and paying homage to the founders of the Baltimore and Ohio, the first extensive steam-powered railroad in the United States, Strother moves on to a detailed account of the excursion, which, in his view, marked the commencement of a new era of human progress in which, for the first time, "the great embodiment of utilitarianism extended the hand to the votaries of the beautiful, claiming brotherhood and asking co-operation." The chronicle of the event starts with a speaking locomotive, described as an "iron horse" and a "steam cock," which, turned on and off by the engineer, directly speaks to the artists through the jargon of American exceptionalism:

> Come, ye gifted of the land—worshippers at the shrine of the beautiful—from sighing o'er the mouldy Past; turn away from heroes that are strangers to your people, from gods that are not theirs . . . come, with hands of skill and hearts of fire, to glorify a Present worthy of your powers. Scorn not the proffered friendship, but let the artist clasp hands with the artisan; let the Poet walk with the People. Illustrate, adorn, exalt, embellish, that the nobler aspirations of the human soul after truth, beauty, and immortality may be realized![21]

The locomotive's call for a national art made of truth and beauty, technology and nature, culminates with a projection of the present into the future. Worried about being remembered in its afterlife, the machine asks to be portrayed by visual artists and writers, so that when the railroad is but a picturesque archaeological remain found by a creature from another world, the outer-space tourist will be able to recognize it: "Write, paint, sketch and chisel that when, ten and thrice ten, hundred years are gone, and when our fires are quenched, our iron bodies heaps of rust, the noble archways

5.3 "Anno Domini MMMDCCCLIX." Woodcut after drawing by Porte Crayon (D. H. Strother), *Harper's New Monthly Magazine*, June 1859.

that have borne us over rivers and mountain gorges shall have crumbled into ruin, the stranger (perhaps some winged creature from some other sphere), finding a mossy stone with the letters 'B. & O. R. R.' may know they stand for the 'Baltimore and Ohio Railroad,' the grandest and most renowned work of its age!"[22]

Two important observations can be made about this passage. First, the locomotive is presented as a living being, not only animalized but also anthropomorphized. This patriotic machine has a body, though made of iron. It expresses opinions about the arts and has feelings of worry about being remembered in the future. The author thus describes a hybridization between the machine and the human.[23] Second, the stadial notion of history appears once again embedded within the trope of the machine in the garden. But this time it is not the past coexisting with the future we are presented with, the American Indians or the wilderness occupying the same space as the technologized landscape and the industrial city. This time the future appears within the present. Yet the historiographic cosmogony is the same: recurrent patterns and cycles through a stadial model of progress and regress. Conveying the topos of republican degeneration and decadence fueled by accumulation of wealth and loss of public virtue, the picturesque ruins of technology waiting in the landscape to be discovered by a future winged tourist from outer space are part of the ambivalent rhetoric of the technological sublime.

Strother's account continues with a description of the special train prepared for the excursion. The train was composed of six cars, drawn by engine no. 232. In perfect tune with the machine aesthetic of the period, when names of locomotives were taken from mythological heroes associated with power and speed, no. 232 is described as "a miracle of power, speed, and beauty, and much such an animal as Job had in his eye when he described Leviathan."[24] Facilities included a dining saloon, a parlor equipped with a piano, tables and desks for writing and drawing, sleeping apartments, and a smoking room. Moreover, the forward compartment of the first car was turned into a photography studio equipped with four large-format cameras and a darkroom.[25] To the "skillful and zealous amateurs of that wonderful and charming art" that occupied the photography studio, Strother addressed a special message of communion between photography and painting: "Brother, give us your hand, though it be spotted with

chemicals. Is not the common love of the beautiful the true bond union between us? What matters whether you see our divinity with eyes of flesh or glass eyes?"[26]

5.4 "A Brother Artist." Woodcut after drawing by Porte Crayon (D. H. Strother), *Harper's New Monthly Magazine*, June 1859.

Having physically incorporated the photographic studio, the art studio, and the writer's office inside its mechanical body, the anthropomorphized train moving through the landscape became a tool for the enactment of a mobile vision in which the difference between the "eyes of flesh" and the "glass eyes"—that is, the human body, the locomotive, and the photographic camera—was blurred. This hybridization of the human and the machine is reflected throughout the article, as well as in its accompanying illustrations.

The concept of photography as painting's "brother artist" is represented in a vignette showing a large-format camera facing a painter. The camera and the tripod form a figure whose height is equal to that of the painter, and there is no photographer behind or beside it. Again, it is a humanized machine we are presented with, standing in front of an artist in a picturesque landscape setting, as if looking at him and conversing with him. The painter is in turn mechanized not only because he seems to be engaged in a conversation with a machine, but also because he stands with his legs open and he has a stick, so that it looks as if he has three legs, just like the camera on the tripod.

This illustration reflects some peculiar aspects of mid-nineteenth-century U.S. culture. In his influential study on imitation and authenticity in America, Miles Orvell points to the fact that the photographic camera appears within the writings of Walt Whitman as a metaphor and model for the poet's creative process.[27] The camera and the negative plate are indeed often invoked by Whitman as equals of the figure of the poet, as well as the tools and content of his work: "Poet! Beware lest your poems are made in the spirit that comes from the study of pictures of things, and not from the spirit that comes from the contact with real things themselves."[28] Taking Orvell's claim one step further, my argument is that the photographic apparatus established an aesthetic model for the appreciation of nature not only within literature but also within the "high" and popular expressions of the visual arts. The aesthetic ideal of the artist/viewer functioning like a mechanical optical device, as well as its connections to practices of immersive viewing typical of panorama and diorama spectacles, will be discussed in the following section.

Landscape, Technology, and Immersive Viewing

As a mechanical process, photography was celebrated in the United States as part of the growing enthusiasm for technology. Satisfying the mid-nineteenth-century taste for realism, the medium was acclaimed for offering a new kind of representation that was free of cultural conventions and artists' personal interpretations. According to early commentators, photographs resulted from an operation of autogenesis, in which optical and chemical processes permitted nature to reveal itself as images. Defined by Oliver Wendell Holmes as a "mirror with a memory," the photographic plate was the origin of images considered ethically perfect insofar as they were products of a purely mechanical device.[29] Since it was a widely shared opinion that photography achieved the best semblance of reality, critics often identified it as being superior to literature and painting in capturing the sublime quality of the American landscape.

In accord with the ideal of representation as a purely mechanical reflection and with the notion of the work of art as the product of a self-generative process, memory and sight were often compared to the photographic camera and the negative plate, resulting in representations of body-machine hybridizations. Such a comparison is found in Emerson's description of Thoreau, with whom he used to take long walks on the outskirts of Concord: "It was a pleasure and a privilege to walk with him. He knew the country like a fox or a bird, and passed though it freely by paths of his own. . . . His power of observation seemed to indicate additional senses. He saw as with microscope, heard as with ear trumpet, and his memory was a photographic register of all he saw and heard."[30] Moreover, Emerson's notorious metaphor of the observer as a "transparent eye-ball," which masterfully exemplifies the myth of self-regeneration in the purity of nature, can be interpreted as modeled on optical lenses and apparatuses, on a fantasy of fusion between technology and the human body:

> In the woods we return to reason and faith. There I feel that nothing can befall me in life,—no disgrace, no calamity (leaving me my eyes) which nature cannot repair. Standing on the bare ground,—my head bathed by the blithe air, and uplifted into infinite space,—all mean egotism vanishes, I become a transparent eye-ball; *I am nothing; I see all*; the currents of the universal being circulate though me. . . . I am the lover of uncontaminated and immortal beauty. In the wilderness, I find something more dear and connate than in streets or villages. In the tranquil landscape, and especially in the distant line of the horizon, man beholds somewhat as beautiful as his own nature.[31]

Immersed in the ecstatic contemplation of nature, the viewer concentrates self-consciously upon the act of looking, allowing sight to subsume all the other senses. The rapt observer thus leaves the rest of the body behind and is aware of himself only as the operation of vision, a pure gaze. The goal of this immersive isolation of awareness within visual experience alone is to rejoin with "infinite space" and the

"currents of universal spirit," but in order to do so, the viewer first has to transcend his own individuality and become a selfless, passive, and mechanic "transparent eyeball." In this state, Emerson's observer, like an optical device, is capable of perceiving nature in each and every detail. Technology thus appears as a metaphor for the human mind and body and as an instrument of amplification of the observer's sense of perception.[32]

5.5 Christopher Pearse Cranch, *Transparent Eye Ball (from Emerson's Nature)*, ca. 1839 (detail). Ink on paper. From Cranch's "New Philosophy" scrapbook, MS Am 1506 (4), Houghton Library, Harvard University.

The notion of a work of art capable of imitating nature's processes of self-generation, together with the ideal of representation as a faithful reproduction of reality as well as the bias against personal interpretation, all reverberate throughout the cultural expressions of the American technological sublime. Like the Emersonian observer in the woods, the landscape artist was instructed to become a "transparent eye-ball." In line with the mid-nineteenth-century aesthetic ideal of representation as a mirror reflection of things, artistic merit lay in the painter's ability to conceal his intervention.[33] Artists were encouraged to go to nature and learn how to carefully look at things, to control vision and imagination in order to remain as close to the visible truth as possible, and to conceive of themselves as transparent and objective instruments of intermediation, so as to enable them to carry out, virtually, the purifying ritual of contemplating uncontaminated nature. In other words, the artist was conceived of as a self-recording machine. As noted by Christian Kassung, self-recording machines were developed in the nineteenth century with the aim of replacing the unreliable human operator with "a technical object (or technical self)" capable of observing "nature innocently at a time when the human body was becoming increasingly uncontrollable or unreliable."[34]

The practices of landscape representation and reception I have thus far described can also be fully inscribed within what the historians of science Lorraine Daston and Peter Galison have identified as "mechanical objectivity."[35] In their influential book on the history of objectivity and the scientific self, Daston and Galison have claimed that a new "objective" way of making images emerged in the mid-nineteenth century. Based on automatism, mechanical objectivity was aimed at the production of images

untouched by human hands, unstained by subjective interpretation. In order to attain such a result, scientists, as well as artists engaged in work for scientific atlases, had to be taught what to see and how to see it, how to control their vision so as to avoid the temptation to interpret, typify, or beautify the observed data, as nature scientists did according to the epistemic model that preceded mechanical objectivity in the eighteenth and early nineteenth centuries. Then, scientists sought to represent not the actual individual specimen but an idealized, perfected exemplar of the natural world. This was accomplished by identifying underlying types and regularities and correcting nature's imperfection through subjective interpretation. Scientists following the new episteme of mechanical objectivity strove to distance themselves from this model. Their ideal observer was capable of training the senses and quieting the will in order to passively register reality in all its details, just like a self-writing machine. This implied self-surveillance and self-control. Also, since machines offered images uncontained by interpretation, they stood for authenticity.

The similarities between mechanical objectivity and landscape aesthetics in the United States at midcentury resonate through this model. This contradicts what Daston and Galison puzzlingly affirm with regard to art:

> The rise of the objective image polarized the visual space of art and science, just as the role of the two domains split over the role of the will. From the sixteenth century, when the illustrated scientific book originated, through the eighteenth century, the relationship between art and science had largely been one of collaboration, not opposition. Only in the early nineteenth century did Romantic artists begin to defend the willful imposition of self as *a sine qua non* of art. For their part, scientists increasingly insisted on the opposite: their images must be purged of any trace of self. Baudelaire captured the distinction when, in his "Salon of 1859," he ventriloquized the positivist painter: "I want to present things as they are, or as they would be in supposing that I do not exist. The universe without man." Baudelaire's imagined artist replied, "I want to illuminate things with my spirit and to project their reflection on others."[36]

These words are the expression of an implicit and sometimes even unaware acceptance of an art-historical *vulgata* according to which early modernism coincides with French impressionism. This results from the persistent adherence, within art history, to a Eurocentric, totalizing, and homogenized notion of modernism, based on the traditional model of authorship, originality, and intentionality. Who says that Baudelaire's perspective was the right one? Who says it was the only one worth considering as a valid avant-garde aesthetic position? Why do we have to dismiss the positivist painter because Baudelaire did not appreciate his art? The way artists in the United States conceived of their work testifies to the fact that art and science did not take separate paths everywhere during the nineteenth century. Furthermore, as the very existence of the positivist painter in Baudelaire's account demonstrates,

5.6 Photographer unknown, group on cowcatcher of train beyond Piedmont, 1858. Salted paper print, 8 × 10 in. Artist's Excursion Over the Baltimore and Ohio Railroad Photograph Collection, Maryland Historical Society, Baltimore.

the view of American artists was not exclusive to the United States but shared in Europe as well.

The longing for an immersive viewing experience to be carried out through a hybridization of the human body with technology appears again in Strother's article in a passage dedicated to the difficult, as well as dangerous, ascent of the Alleghenies "by one bold leap."[37] Strother recounts how a number of fearless excursionists, including the three ladies on board, confidently took their seats on the front of the engine and on the cowcatcher, in order "to obtain a better view of the grand scenes which were opening before and around them." The steam locomotive is described as a reliable, steady, and docile "mighty steed" that the passengers feel absolutely confident with, so that "the gentlemen considered it a privilege to get a place, while their gentler companions reclined upon his iron shoulders and patted his brazen ribs as though he were a pet pony."[38] Not only are the passengers described as trying to blend themselves with the very front portion of the train, but the locomotive appears full of affection toward them: "As might and magnanimity are supposed to be inseparable, we may doubtless imagine that '232' appreciated his position; that he humped himself with pride,

5.7 "Ascending the Alleghanies." Woodcut after drawing by Porte Crayon (D. H. Strother), *Harper's New Monthly Magazine*, June 1859.

moderated his whistle, and 'roared as gently as a sucking dove,' tripped it mincingly up the savage steep-smoothly as though his joints were greased with perfumed oil."[39] A number of photographs were taken to immortalize the passengers' bravery as well as the benevolence of the loving locomotive. Strother's article contains a romanticized version of these photographs, a woodcut showing the intrepid and happy passengers crowded onto the cowcatcher while the train climbs up a mountain. Along with the article's narrative, these images convey the passengers' desire to blend with the locomotive in order to get an immersive, panoramic view of the scenery opening "before" and "around" the very front of the train. This practice anticipates the popular early cinema genre of the phantom ride (or panorama), shot by positioning a camera and a cameraman in front of a moving train.

The transparent eyeball through which the observing subject is "uplifted into infinite space" so that "the currents of the universal spirit circulate through" him and the B&O passengers blending with the locomotive in order to get the best view of the scenery opening "before" and "around" them have a lot in common with the immersive form of spectatorship experienced in panorama and diorama spectacles as described by Alison Griffiths.[40] Applying models of spectatorship traditionally used

in cinema studies to forms of spatial illusions that preceded the movies, Griffiths has pointed to the fact that the panorama, with its all-encompassing view that surrounded the spectators, offered the public an immersive entertainment par excellence. The panoramas' majestic domed circular buildings containing huge 360-degree paintings produced in the observers a sense of wonder and quasi-religious feelings reminiscent of the experience of medieval cathedrals. Moreover, the spectator was enveloped in an artificial reality by which he or she was absorbed by way of a virtual transport enacted through sight. Finally, the panorama experience was centered on reenactment, on the idea of spectatorship as a form of revisitation, as if the observers were witnessing something that had already occurred in a different place and at a different time, as if the scene represented was happening along an immediate temporal and spatial presence and continuity.

Not only was artistic creation described as a mechanical process of optical objectivity through the recourse of imagined hybridizations of the human and the machine (the steam locomotive, the photographic apparatus, the optical lens), but practices of spectatorship based on the panoramic model of immersive viewing and reenactment were constitutive components of railroad paintings, photographs, engravings, and promotional celebrations and events. Often reinforced by the use of binoculars, opera glasses, and magnifying lenses, in yet another instance of bodily perception being expanded through technology, the viewer's immersed gaze could "enter" the surface of the image so as to perform a virtual peregrination within its confines, thus rendering possible collective participation in the adventurous expeditions first carried out by explorers and pioneers. Blurring the line between looking *at* and looking *through*, this mechanized, objective, and immersed observer alternated between an interpretive emphasis upon a single individual "I" and the collective "we." This demonstrates that the network of communication formed by photography, prints, paintings, the railroad, the postal system, and the illustrated press played a crucial role in the formation of viewing practices that structured cultural sentiments and aesthetic dispositions about U.S. nationhood at home and abroad.

Notes

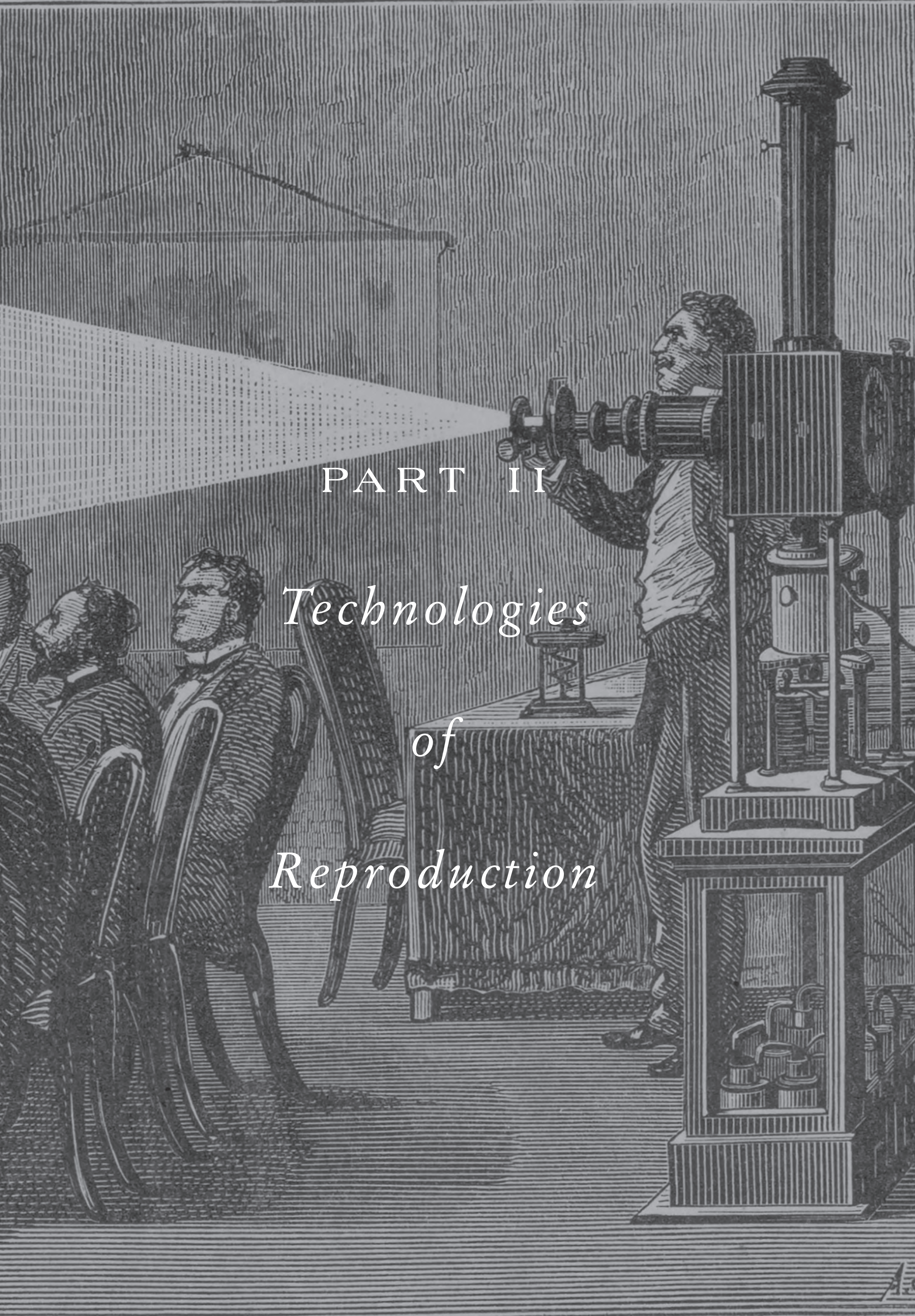
1. Kennedy, "Crossing Continents," 119.
2. Danly, introduction to Danly and Marx, *The Railroad in American Art*, 11.
3. In the past two decades, scholars working within fields such as art history, the history of photography, anthropology, material culture studies, and media studies have produced groundbreaking works on the materiality of image as objects. See, e.g., Gell, *Art and Agency*; Edwards and Hart, *Photographs Objects Histories*; Poole, *Vision, Race, and Modernity*; Batchen, *Each Wild Idea*; Huhtamo, *Illusions in Motion*; Pinney, *Photography's Other Histories*; Miller, *Materiality*; Gitelman, *Always Already New*; Roberts, *Transporting Visions*.
4. Nye, *American Technological Sublime*.
5. See, e.g., Maddox, "Thomas Cole and the Railroad," 3–4.
6. Danly, introduction, 1–4; Marx, "The Railroad-in-the-Landscape."
7. Miller, *The Empire of the Eye*, 21–64; Miller, "The Fate of Wilderness"; Wallach, "Thomas Cole's *River in the Catskills*." Stephen Daniels, for instance, observed

that Cole's work expressed more the aspirations of the railroad's investors than the realities of its operation. Daniels, *Fields of Vision*, 165–67.

8. For a discussion of stadialism within narrative accounts of national identity in the United States, see Allen, *A Republic in Time*, 41–58.
9. Marx, *The Machine in the Garden*.
10. Examples of scholars who have analyzed print and visual culture as one are Dinius, *The Camera and the Press*, and Henkin, *City Reading*.
11. For an account of art unions in the United States, see Lett, Hills, and Brownlee, *Perfectly American*.
12. Natale, "Photography and Communication Media."
13. Bierstadt Brothers, *Stereoscopic Views* and *Gems of American Scenery*.
14. Bierstadt Brothers, preface to *Gems of American Scenery*.
15. "An Excursion on the Baltimore and Ohio Railroad," 208; "Domestic Art Gossip," 27; "Domestic Art Items and Gossip," 207.
16. "An Excursion on the Baltimore and Ohio Railroad," 210.
17. Porte Crayon, "Artists' Excursion over the Baltimore & Ohio Rail Road," 6.
18. "An Excursion on the Baltimore and Ohio Railroad," 208.
19. Maddox, "The Railroad in Eastern Landscape, 1850–1900"; Danly, introduction, 5–8; Mazow, "'And Picturesque It Everywhere'"; Poesch, "An Artist's Excursion."
20. Porte Crayon, "Artists' Excursion over the Baltimore & Ohio Rail Road."
21. Ibid., 5.
22. Ibid.
23. For a discussion of photography and the emergence of the cyborg in the nineteenth century, see Erkki Huhtamo's chapter in this book.
24. Porte Crayon, "Artists' Excursion over the Baltimore & Ohio Rail Road," 6.
25. "Domestic Art Items and Gossip," 207.
26. Porte Crayon, "Artists' Excursion over the Baltimore & Ohio Rail Road," 6.
27. Orvell, *The Real Thing*, 4–7.
28. Whitman quoted in Orvell, *The Real Thing*, 6.
29. Trachtenberg, "Photography."
30. Emerson, "Biographical Sketch," 21–22.
31. Emerson, "Nature," 39.
32. Leonardi, *Il Paesaggio Americano dell'Ottocento*, 51–55.
33. Asher Brown Durand's nine "Letters on Landscape Painting" published in the *Crayon* between 1855 and 1856 offer an emblematic example of this aesthetic discourse.
34. Kassung, "Self-Writing Machines." See also Morus, *Bodies/Machines*.
35. Daston and Galison, *Objectivity*, 191–251.
36. Ibid., 187–88.
37. Porte Crayon, "Artists' Excursion over the Baltimore & Ohio Rail Road," 13.
38. Ibid.
39. Ibid., 14.
40. Griffiths, *Shivers Down Your Spine*, 37–78. The changes of vision brought about by train travel have been analyzed in relation to the panorama by Wolfgang Schivelbusch in his seminal study on the impact of the railroad on industrialized consciousness (Schivelbusch, *The Railway Journey*, 62).

PART II

Technologies of Reproduction



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Peer Production in the Age of Collodion

The Bromide Patent and the Photographic Press, 1854–1868

LYNN BERGER

> The progress of Photography is owing to the fact that it is everybody's property. . . . Science in America is [about] to be chained to the block of personal privilege by a set of men closeted within the walls of the Patent Office of the United States in Washington.
>
> —"Origin of Bromides," *Humphrey's Journal*, 1860

"Experience," Henry Hunt Snelling wrote in the first issue of the *Photographic Art-Journal* in January 1851, had "taught the world that secresy [*sic*] is the great bar to all earthly well-being."[1] In business, "intercommunion" and freely shared information were the key to success, and the periodical press facilitated both: farmers, merchants, and mechanics, for instance, all boasted a "printed organ of intercommunion, for their own special benefit." Why then, Snelling asked rhetorically, "should not the Daguerreotypist be equally benefitted by a periodical devoted to his interests, particularly when his art is so susceptible to improvement?"[2]

Photography was a new medium in the nineteenth century—one, it might be added, of many.[3] The scene it entered was littered with other media and technologies, some new, others not so new, and its uses were determined in reference to, and sometimes through, these other media. One key medium that helped shape the meaning and identity of photography and its practitioners was the periodical: in fact, many, if

not most, Americans first encountered the daguerreotype through verbal descriptions in the popular and scientific press.[4] Specialized photographic journals, first launched in the United States in 1850, were instrumental in the construction of a photographic community—a community with particular values and sanctioned practices, "knowledge sharing" and "collective invention" chief among them.

This essay looks at how the photographic press encouraged and facilitated knowledge sharing and collaboration within the nascent photographic community in the United States. I argue that the photographic press enabled something we might today recognize as "peer production" and hosted a prolonged debate about the nature of intellectual property. In particular, I examine the role played by several American photographic journals, including Snelling's *Photographic and Fine Art Journal* (*PFAJ*), Charles A. Seely's *American Journal of Photography* (*AJP*), and Edward Wilson's *Philadelphia Photographer* (*PP*), in the opposition to James Cutting's bromide patent between 1854 and 1868—a period marked by the rise of the photographic press as an important photographic institution and by the consolidation of photography as, among other things, a trade and a profession.

Although the use of so twenty-first-century a term as "peer production" in a discussion of nineteenth-century photography might seem anachronistic, I hope to convince the reader that this concept—a value-laden term that I will not adopt uncritically—helps illuminate a crucial aspect of photographic history.[5] Historians of photography have often turned to mid-nineteenth-century photographic journals like *PFAJ* and *AJP* in the United States, the *British Journal of Photography* and *Photographic Notes* in Great Britain, or *La Lumière* in France.[6] Yet the way in which these journals fostered knowledge sharing and collective invention, the ideas they disseminated about intellectual property, and how they served as vehicles for activism have largely escaped the radar. Perhaps this is so because they do not fit easily into a narrative that privileges individual artistic genius or questions of aesthetics, style, or genre. But in addition to a form of art, photography was of course also a science and a business—one featuring "start-up compan[ies] in a new, risky high-tech industry" at that.[7] The science and "labor" of photography were often collective enterprises, abetted by the photographic press. In highlighting the relatively open and collective nature of mid-nineteenth-century American photographic practice and innovation, this essay shows not only that the history of photography was closely linked to that of at least one other medium—the printed journal—but also that "peer production" far precedes the digital age with which it is so intimately associated.

The Photographic Press: A Brief Introduction

The early 1850s marked a turning point in the—at that point still relatively short—history of photography. Introduced in the previous decade, by midcentury photography in the United States displayed all the trappings of an established medium, including a

number of agreed-upon social and scientific applications, an industry of production and consumption, and a sizable group of practitioners.[8] It was the beginning of the "age of collodion," defined by the gradual move from daguerreotypy to the easier, cheaper, and intrinsically reproducible process of glass negatives and paper prints. With that, photography left the pioneering stage and entered a more stable phase—one in which its commercial, scientific, and artistic potential could be explored and developed more fully.[9]

That photography should beget its own specialized press made sense; as it happened, 1850 had also marked "a new era in the history of American magazines."[10] Through a combination of technological, economic, and legal developments, including the invention of the steam press, new devices for paper-making, and the development and expansion of the postal system, magazine publishing had become a more accessible—if still risky—venture, while magazines had "gained legitimacy in the eyes of the reading public."[11] This meant that the "passion for periodical literature which characterize[d] the age," as the *New York Quarterly* put it in 1854, was sustained by nearly seven hundred periodicals that catered to a variety of special interests: religious groups, reform movements, and hobbyists of various stripes all sported their own periodicals.[12] These included trade journals, of which there were hundreds, all intended to help "the members of emerging professions and other specialized occupations develop common standards of practice and distinct identities."[13]

Samuel Dwight Humphrey's *Daguerreian Journal*, soon renamed *Humphrey's Journal* (*HJ*), was launched in November of 1850, followed the next year by Henry Hunt Snelling's *Photographic Art-Journal*, which later became *PFAJ.* Both journals were published in New York, as was *AJP*, launched by Charles A. Seely in 1855.[14] Other countries soon followed suit, and by the end of the decade, there were "at least one dozen" photographic journals in circulation in the United States and Europe. Frequently reprinting extracts from one another, they constituted an international network for the dissemination of photographic knowledge, know-how, norms, and values.[15]

The American photographic journals sought to unite a growing but also diversifying community of photographers—one that included gentleman amateurs as well as professional photographers, who all espoused different business strategies and technical and aesthetic standards. Believing that, as one editor put it, "in union there is strength," the editors of these journals tried to advance photography technologically, socially, and culturally by improving communication and cooperation between its practitioners and theorists, educating its representatives in the practical and moral facets of the trade and instilling a common set of standards and values.[16]

Among those values, openness and collaboration ranked especially high. If photography was to "assume a higher sphere and maintain it," Snelling wrote, a photographer stumbling upon a new discovery should not keep it to himself: "It is a great mistake to suppose that individual benefit can result from such a course; it is only by free communication and interchange that permanent advantage can be derived from

them."[17] Snelling and Seely encouraged photographers to submit their discoveries to their journals—and many of them did.[18]

In addition, both *PFAJ* and *AJP* reported on and evaluated newly issued photographic patents.[19] "The practice of the Commissioners granting to almost all who apply, patents for the products of other mens' [*sic*] brains, because of some trifling, and perhaps, valueless variation, is becoming . . . so serious a matter, that it almost necessitates a 'Vigilance Committee' to examine into the various claims," Charles Seely's business partner Henry Garbanati wrote in *AJP* in 1858.[20] Seely and Garbanati saw it as their right—anyone's right, really—to "review [patent examiners'] decisions about photography; and we need not hesitate to differ with them and contest them."[21]

In between the encouragement of sharing information and a critical stance toward patents, one finds in the pages of the photographic press an ambivalence about intellectual property—a conflict between a "scientific," communalist model in which data are shared, experiments are repeated by peers, and progress is achieved through cooperation and a more individualistic and internalist notion of innovation, like the one enshrined in patent law, where progress is the result of individual inventors working for the rewards that come from a (temporary) monopoly.[22] If the patenting of photographic innovations was not rejected outright, this was so only because it was understood that some people needed, simply, to make a living.[23]

Secrecy was anathema, patenting was acceptable, but sharing was golden. "Man can only live happily in free intercourse with his fellow man," Snelling wrote. He believed that a photographer would "derive far greater advantage from [an invention] by permitting its use by others, than by keeping it entirely to himself": the credit that came with sharing would ensure a steady flow of business.[24] After all, in science and art, making discoveries available to the world "had always proved the most lucrative to the individual, because it not only begets confidence in his ability among the masses but gives him a world wide reputation—a standing in his particular profession or business that is world wide."[25]

Peer Production in the Age of Collodion

In a sense, journal editors and contributors conceived of photography as what we today would recognize as a commons-based, peer-produced technology.[26] In the words of legal scholar Yochai Benkler, production is "'commons-based' when no one uses exclusive rights to organize effort or capture its value, and when cooperation is achieved through social mechanisms other than price signals or managerial directions." When such cooperation takes place on a particularly large scale, it is called "peer production": work is broken up into little pieces, allowing participants to contribute "at different levels of effort consistent with their motivation." Peer production relies on indirect rewards rather than direct payment, with those rewards being either external, including "enhancing reputation and developing human capital and social networks,"

or internal, involving the satisfaction of "psychological needs, pleasure, and a sense of social belonging."[27]

Since commons-based peer production is especially visible in the online realm—think of open-source software or online encyclopedias like Wikipedia—its analysts tend to see it as an emerging property of the digitally networked environment. In their view, new communication technologies—"the technical infrastructure of the Internet"—enable new types of collaborative and even selfless behavior.[28] But in the nineteenth century, the photographic press likewise enabled knowledge sharing and collaboration among many geographically dispersed individuals—with no single, centralizing authority to organize the direction of incremental innovation and motivated by rewards other than direct payment.

In fact, as business historians have recently begun to show, knowledge sharing and collective innovation were much more common in the nineteenth century than is generally believed.[29] Among the advantages of knowledge sharing, then as now, were the creation of common standards or best practices—which could end up having economic benefits as well as the promise of future reciprocity, just as Snelling recognized.

Like today's hackers and open-source activists, the user-innovators and editors of early photography believed that knowledge sharing would benefit not just the technology itself but also the person doing the sharing. They were often right: Bellevue Hospital's resident photographer, Oscar Mason, for instance, frequently shared his tweaks and inventions through journals, banking upon his reputation as a scientifically minded photographer by soliciting business as an independent consultant.[30] Henry T. Anthony—a partner with his brother in the supply house of A. & H.T. Company and also, in 1870, the founder of *Anthony's Photographic Bulletin*—often gave new formulas or techniques to photographers he had befriended, who would subsequently pass them on to the photographic community by writing to the journals, crediting Anthony as the originator of the idea.[31]

In short, the photographic press in the nineteenth century encouraged and fostered "peer production" by facilitating communication between photographers, reviewing patents and helping to settle patent disputes out of court, and providing reputational advantages to photographers willing to share their knowledge.[32] At times, it also facilitated collective action against patents that either had been unjustly granted or were too stringently enforced—as the example of the bromide patent will show.[33]

The Bromide Patent and the Press

In the summer of 1854, inventor James A. Cutting of Boston was granted three patents for improvements in photography. One of these, U.S. Patent no. 11,266, covered the use of collodion and potassium bromide in photographic emulsions. With that, Cutting made a claim on every photographer who used the wet collodion process—which meant, at the time, the vast majority of American photographers.

When *Humphrey's Journal* learned of the patent, it remarked that "a number of our American photographers are in the habit of taking European experiments and appropriating their results to their own personal benefit, and not even giving in return an acknowledgment."[34] Cutting partnered with several agents, selling licenses to photographers and supply houses. Soon enough, photographers began to debate the patent's validity in the pages of *PFAJ* and *AJP*.[35]

A couple of years later, Cutting and some of his licensees began the first of a prolonged series of legal battles against photographers infringing upon the patent.[36] In 1857, for instance, Cutting's New York agent, W. A. Tomlinson, commenced a suit against Abraham Bogardus for the use of bromide in collodion. Bogardus, deciding that the claim was too laborious and costly to disprove, settled with Tomlinson out of court—an outcome that for some reason was billed as a victory for the claimant.[37] Thus emboldened, Tomlinson embarked on a similar suit against the prominent and well-respected daguerreotypist Charles D. Fredricks.

At this point, Snelling and Seely began using their journals as vehicles for activism against what they deemed an unjustly granted, and unfairly exploited, patent. (Indeed, the main point of contention was not whether photographic inventions should be patented at all, but rather whether Cutting had, in fact, been the true and first inventor of the use of bromide in collodion.) In January 1859, shortly after Bogardus and Tomlinson had settled, Seely reprinted the court proceedings in his journal. In an editorial, he told his readers, "Don't be alarmed by any ridiculous threats of shutting up your business. If you have infringed the patents in the past, pay only what is reasonable. If you are unwise enough to be infringing them still, we have no advice and no sympathy for you."[38] In the next issue, a columnist writing under the name of "Gossip" disagreed with Seely's advice, expressing the sincere hope that "every man who has a dollar he intends devoting to the art, instead of paying it as black mail for the privilege of using what he had a right to use, will put it in a general fund for the purpose of thoroughly testing the question, and pledge the fund to the defense of any or all who are attacked by the would-be monopolist."[39] Seely's partner, Garbanati, meanwhile, asked photographers to oppose the patent "as one body": if all would unite and prove that using bromide of potassium in collodion had been common practice before Cutting had patented it, then it would become clear that "the patent officers had no more right to grant a monopoly of this than of the air we breathe."[40]

In February of 1860, a large number of photographers convened at the Cooper Union in New York. The meeting had been jointly organized by Snelling and Seely and advertised in their journals; Seely chaired the meeting, while Snelling acted as secretary, and reports of this and subsequent meetings were published in both journals. The object of the meeting, Seely explained, was "to devise means to defeat the suit now pending against Mr. Charles D. Fredricks"; since the matter was "of vital importance to the whole Photographic Community, it was not right that the defendant in this suit should be saddled with the whole expense necessary to its prosecution."[41]

Snelling and Seely asked photographers to contribute money to what would soon come to be known as the "Fredricks Fund" to defray the expenses of the suit. In thus organizing collective action, they emphasized the two key values they associated with the practice of photography: a sense of community and fraternity, as well as an understanding of photographic knowledge and know-how as collective goods. "What was intended, by its inventor, to be free to all, may become the monopoly of one man," Snelling wrote.[42] As A. Ceileur, Tomlinson's counsel in *Tomlinson v. Fredricks*, had put it in 1858, "the progress of Photography is owing to the fact that it is everybody's property. Scientific men of every nation set to work and tried, by improvements, to perfect that branch of modern science." Now, Ceileur went on, "in the very midst of admitted superiority and anticipated final success—the science receives a check in a country which, above all others, claims the right of championship for liberty and free institutions. Science in America is to be chained to the block of personal privilege by a set of men closeted within the walls of the Patent Office of the United States in Washington."[43] *Tomlinson v. Fredricks* generated discussion beyond intellectual property rights. Some photographers hoped the case would help to "purify" the profession from cheap operators unable to pay the license fees.[44] For others, the suit was little more than a free advertising stunt for a photographer (Fredricks) who didn't even need one.[45] Thus questions of ownership, community, and class all became bound up with the bromide patent as the community awaited the outcome of the case.

During the spring of 1860, *HJ*, *AJP*, and *PFAJ* published the names of contributors and a tally of funds received—a little over $750 in all, while it was estimated that $2,500 would be necessary to defeat the patent.[46] Seely devoted the better part of *AJP*'s March 1, 1860, issue to the case, with articles on its history, a reprint of Cutting's Letters Patent, reports of the meetings to establish the Fredricks Fund, and extracts from letters of subscribers, most of whom supported collective action.

But the case itself went dormant, and from the fall of 1860 onwards, the topic slowly trickled out of the pages of the photographic press.[47] Snelling succumbed to a nervous breakdown and allowed *PFAJ* to be subsumed into *AJP* in November of 1860.[48] The following year marked the onset of the Civil War, and it would not be until after that war's end that the bromide patent became, once more, a cause for concern.

Intimidation, Extension, and Collective Action

In 1864, a new photographic journal entered the scene: the *Philadelphia Photographer* (*PP*), a biweekly journal edited by Edward Livingston Wilson. Together with Seely's *AJP*, Wilson's *PP* continued the battle against the bromide patent when it was rekindled.

In early 1865, ownership of the Cutting patent fell almost entirely into the hands of the Boston lawyers Thomas H. Hubbard and W. E. P. Smythe, who embarked upon a more effective enforcement policy than their predecessors. When Hubbard restarted

Tomlinson v. Fredricks, Fredricks initially continued his oppositional course, using the funds provided by the photographic community in 1860. But, as he reported in a posttrial letter to *HJ* and *AJP*, Hubbard had presented "evidence which, we found upon thorough investigation, could not be rebutted, [and] we were compelled to submit to a decree of the Court *against us*."[49] For the sum of nine hundred dollars, Fredricks wrote, he was now licensed to "use the invention claimed by the Patent" for the remainder of that patent's term, which would end in 1868.

After Fredricks's defeat, most photographers decided to cut their losses and pay up. In a joint circular, the leading photographic supply houses stated that *Tomlinson v. Fredricks* led them to believe there was "no longer a possibility of a chance to defeat the Patent" and recommended "that parties using Collodion for Photographic purposes . . . make arrangements therefor with Mr. Tomlinson."[50]

Seely was disappointed: "For many years we have kept up a good fight, and while we fancied ourselves almost victorious, our inglorious defeat was organized and consummated." He concluded that while it was "humiliating to acknowledge defeat . . . it may be better than to fight when there is no chance of success."[51] In the next issue, he added that "if the constituted authorities consider [the bromide patent] valid, it should be enforced. We have no objection to an invention simply because it is patented."[52]

Wilson agreed. While his "sympathies [had] ever been with the photographer, and not with the patentee," it was "our duty as good citizens to submit to the infliction the law may place upon us, be it ever so grievous and unreasonable." *Tomlinson v. Fredricks* had set a precedent, and, Wilson wrote, "bitter as this pill may be to all, we are compelled to swallow it with our friends." The only consolation lay in the fact that "time is short and that the dose will not have to be taken much longer"—1868, after all, wasn't that far away.[53]

Even more than Tomlinson, Hubbard seems to have been what in the mid-nineteenth century was called a "patent shark": a speculator buying up the rights to a patent to extract money from witting and unwitting infringers.[54] In March 1866, Hubbard sent an agent to Cincinnati "to make collections for infringement upon the Bromide Patent." Cincinnati photographers called a meeting and appointed a committee to "collect facts" about the patent; soon enough, Hubbard appeared in Cincinnati himself "with the intention of commencing legal proceedings against [the photographers] as infringers." He addressed a meeting at which "nearly all of the photographers of the city [were] present," telling them they "may delay, but they cannot defeat this patent, and for the delay and expense they make me, they . . . must in the end suffer." His audience was quickly convinced that paying for licenses was the best course to take.[55] That same year, Hubbard tried to file suit against the U.S. government for using bromide in collodion during the Civil War. The case seems never to have materialized but does attest to his belligerence and might explain why most photographers preferred paying up to continuing resistance.[56]

Seely's *AJP*, meanwhile, published a long-running debate on the wisdom, or not, of paying license fees, in the form of letters to the editor advocating both sides. This

more or less neutral editorial approach raised the ire of some subscribers, and in November 1866, Seely wrote an editorial addressing accusations of his journal being "a special and paid advocate of the bromide patent interest"—a "misapprehension" that he deemed "injurious to the Journal," especially given his earlier attempts to oppose the patent.[57] His editorial ended in a defeated tone: "the history of the patent contest shows that an opposition has had poor chances of success."[58]

In May of the following year, Seely assigned his journal to new management, and in May 1867, *AJP* ceased publication altogether. (Incidentally, James Cutting passed away that same year.)[59] Whether Seely's disappointment over the bromide patent case had anything to do with his leaving the publishing business is impossible to know—but if it was, then he had stepped out of the game a little too soon.

"A Campaign of Resistance"

The bromide patent's fourteen-year term was set to expire in 1868. When Hubbard planned on applying for an extension, the photographic community sprang into action—more effectively, this time, than before. With Snelling and Seely gone from the scene and *Humphrey's Journal* having less of an activist bent, Edward Wilson's *Philadelphia Photographer* became the main site for activism. A National Photographic Convention was organized on April 7, 1868, again at the Cooper Union, "to map a campaign of resistance to the imminent possible extension . . . of a patent which would, in effect, allow one man and his agents to license virtually all photographic practice."[60] Wilson served as treasurer and secretary.

The convention and the ensuing reporting in *PP* helped to raise funds from the photographic community—almost $4,600 this time—and Wilson hired two Philadelphia lawyers to help him challenge the application for extension.[61] He built a case to prove that the patent never should have been granted in the first place, drawing on evidence from witnesses who had known Cutting at the time of his application as well as on national and international published sources documenting the first uses of bromide in collodion.[62] Wilson was able to convince Patent Office examiner Titian R. Peale to recommend against an extension. It was Peale who had granted the patent fourteen years earlier; having now reversed himself, he wrote to the acting commissioner of patents that Cutting "was not the original or first inventor of the compound of bromine for making photographic pictures, for which the patent was granted to him on the 11th of July, 1854."[63] On July 10, 1868, the acting commissioner of patents denied the extension.

"The applicant for an extension of the infamous and fraudulent Bromide Patent," Wilson wrote in the August issue of *PP*, "has been refused the same by the Commissioner of Patents, and the photographic community is free from its claims forever." He wished to "earnestly congratulate the craft on their success in opposing this matter." It had, he admitted, not been easy on him to "conduct the opposition":

"There were many ups and downs connected with the case. Often our hopes would arise like a balloon in the clear, pure air, then tumble disgracefully down and beat about upon the ground."[64] In the end, though, he had succeeded—aided by the fraternity.

Epilogue: From Open Innovation to Black Boxes

In the years that followed, the photographic community—connected now through the *Philadelphia Photographer* as well as two newly launched journals, *Anthony's Photographic Bulletin* and the *Photographic Times*; various photographic societies; and the National Photographic Association—would continue to "closely monitor the granting and exploitation of photography-related patents, and collectively [challenge] the validity of a number of these."[65] Photographers continued to use the photographic press as well as photographic societies to freely share tweaked processes and discoveries.[66] Oscar Mason, the Bellevue photographer who had briefly managed the advertising department at the *American Journal of Photography* in the mid-1860s, became an editor at the *Photographic Times*, where he frequently offered solutions to problems that he had encountered and that other photographers might grapple with as well.[67] "The interchange of thought and experience through the medium of our photographic text-books and periodic literature, is bringing forth fruit which all who read may gather," he wrote in 1871.[68]

But the field, as fields are wont to do, was changing. Starting in the 1880s, with the introduction and development of the gelatin dry plate process, photography entered a new era, one marked by a major increase in the number of amateur photographers, a sweeping change in the nature of their practice, as well as "the rise of firms as controllers of knowledge and intellectual property."[69] With the introduction of cheap and easy-to-use cameras like those produced and marketed by Eastman Kodak, the number of photographers grew while the number of photographic user-innovators shrank. The era of relatively open and collaborative innovation, in which users were also innovators and technical and chemical know-how were freely distributed among the practitioners of the medium, closed, giving way to a world in which the camera became to most users, metaphorically as well as literally, a black box.

At the same time, taking pictures became accessible to vastly more people, and photography became the intricate part of personal and public life it still is today. But the photographic press ceased to be the prime vehicle for "intercommunion" among a relatively homogenous group of photographers, allowing them to take part in a nineteenth-century form of "peer production," to identify with values of openness and sharing, and to spring to action collectively when it appeared those values were imperiled.

Notes

1. Snelling, "Art of Photography," 1.
2. Ibid., 2. For more about Snelling, see Olmstead, "Father," and Snelling, "Memoir."
3. Gitelman, *New Media.*
4. Dinius, *Camera and the Press.*
5. Using notions developed in the context of digital media to address a historical case study has precedent in new media studies and media archeology. See, e.g., Park, *Long History*; Gitelman, *Paper Knowledge*; and Peters, "Bibliographic Case."
6. Taft, *American Scene*; Tucker, *Nature Exposed*; Sheehan, *Doctored*; Edwards, *Allegories*; Volpe, "Cartes de Visite"; Edwards, *Camera as Historian*. For a complete overview of nineteenth-century photographic journals in America, Europe, and elsewhere, see Sennett, *Nineteenth-Century Photographic Press.*
7. Batchen, "Labor of Photography," 295.
8. Davis, *Origins of American Photography*, 75. See also Jenkins, *Images and Enterprise*, 18–19.
9. Jenkins, *Images and Enterprise*; Battani, "Organizational Fields"; Gernsheim, *Age of Collodion*; Wickliff, "Light Writing."
10. Mott, *History of American Magazines*, 3. See also Lupfer, "Business of American Magazines."
11. Haveman, "Entrepreneurship," 588.
12. Belasco, "Cultural Work," 260.
13. Haveman, "Entrepreneurship," 593.
14. Marder, "Nineteenth-Century American Photographic Journals."
15. Sennett, *Photographic Press*, 6.
16. Snelling, "Photographic Reunions," 109.
17. Snelling, "Art of Photography," 2.
18. "Pictures on Dry Collodion"; Duchoichos, "On Caseine." See also Welling, *Formative Years*, vi; Jenkins, *Images and Enterprise*, 33; and Eskind, "Amateur Photographic Exchange Club," 109.
19. "Photographic Patents," 202.
20. Garbanati, "Photo-Lithography," 36.
21. Seely, "The Cutting Patents," 256. For more about the Patent Office and nineteenth-century patent controversies, see Khan, "Property Rights"; Lamoreaux, "Patent Alchemy"; and Beauchamp, "Patent Litigation."
22. Bowker, "Patent."
23. Of course, the history of intellectual property in general could be characterized as one prolonged, continuous "competition between two different characterizations of legitimate ownership of knowledge. On one hand there is the belief that individuals should benefit from their intellectual endeavors, but on the other is the notion that these endeavors have such extensive public worth that there is a clear social interest in their free dissemination." Sell, "Moments in Law," 468.
24. "Knowledge of the Art," 50.
25. "Personal and Art Intelligence," May 1855, 159.
26. Mercelis, "Stages of Openness."
27. Benkler, "Commons-Based Strategies," 1110.
28. Benkler, "Commons-Based Strategies"; Benkler, "Virtue"; Lerner, "Economics of Technology Sharing."
29. Bessen and Nuvolari, "Knowledge Sharing."
30. Mason, "Copying"; Mason, "Photographers Exchange and Agency."
31. Thompson, "News from America" (cited in Eskind, "Exchange Club," 74); Borda, "New Rapid Dry Process" (cited in Eskind, "Exchange Club," 74–75).
32. "All About a Ground Glass"; Howell, "Letter."
33. Mercelis, "Stages of Openness," mentions as examples the sliding plate holder patented by Wing and an apparatus for recovering silver and gold from photographic waste designed by Shaw.
34. Cited in Welling, *Formative Years*, 107.
35. See Root, "Collodion Process"; "Personal and Art Intelligence" (July 1855); and "Personal and Art Intelligence" (August 1855).
36. Welling, *Formative Years*, 118.
37. "The Cutting Patents," 46.
38. "Editorial Miscellany" (January 1, 1859), 240.
39. Gossip, "Letter," 250.
40. Garbanati, "Use of Bromine," 267–68.
41. "The Cutting Patents," 46.
42. "Editorial Matters," 56.
43. "Origin of Bromides," 339–41.
44. Fitzgibbon, "The Fredricks' Fund."
45. Masury, "The Cutting Patents."
46. "The Cutting Patent" (May 1860), 140.

47. Welling, *Formative Years*, 154.
48. "Editorial Miscellany" (December 1, 1860), 208.
49. "The Cutting Patent" (November 15, 1865), 219; "The Cutting Patent" (November 15, 1865), 235.
50. Cited in "Editorial Department" (November 15, 1865), 239.
51. Ibid.
52. "Editorial Department" (December 1, 1865), 263–64
53. "The 'Cutting Bromide Patent,'" 11.
54. John, "Patent Politics"; Beauchamp, "Patent Litigation Explosion."
55. Watson, "Cutting Patent in Cincinnati."
56. "Special to the Photographers."
57. Seely, "The Bromide Patent," 136.
58. Ibid., 138.
59. "Death of an Inventor."
60. Welling, *Formative Years*, 195.
61. Cremer, "Report," 313.
62. Welling, *Formative Years*, 196.
63. Quoted in ibid., 197.
64. "Defeat of the Bromide Patent," 249–50.
65. Mercelis, "Stages," 3. *Humphrey's Journal* folded in 1870.
66. See, e.g., "Report of the Committee."
67. See, e.g., Mason, "Error."
68. Mason, "The New School," 96.
69. Mercelis, "Stages," 4.

{ 7. }

Two or Three Things Photography Did to Painting

JAN VON BREVERN

La photographie, si exacte en face de la nature, devient fantasque en face des tableaux.

—Théophile Gautier, 1858

Introduction: Delacroix Looks at Rubens

On a November evening in 1853, the painter Eugène Delacroix took a walk through the Galerie Vivienne, one of Paris's first arcades. In the shop window of the bookseller Petit-Siroux, something caught Delacroix's attention—it was an album with photographic reproductions of paintings. "What attracted me," he later wrote in his diary, "was the *Elevation of the Cross* by Rubens; it interested me very much: the incorrections, no longer being saved by the handling and the color, are more clearly seen."[1] For Delacroix, the photograph of the Rubens seemed to strip the picture of its painterly style, uncovering the delineations and exposing the imprecisions in Rubens's manner of painting.[2]

When one thinks about the relation of photography and painting in the mid-nineteenth century, this short episode is remarkable in a number of ways. First of

7.1 Eugène Desplanques, photographic reproduction of Peter Paul Rubens's *Elevation of the Cross* (1609/10). From Louis Désiré Blanquart-Evrard, ed., *Les tableaux célèbres* (Paris: BnF, 1854).

all, it is important to note that as a painter, Delacroix is attracted by a reproduction of an artwork and not by a photograph that claims itself to be of artistic value. As I will argue, it was, in fact, photography as a reproductive medium (as opposed to art photography) that changed the traditional arts most thoroughly. A second significant aspect is that photography does not appear here, as it does in other writings of the time, as a mere mimetic repetition of the world. Rather, it significantly transforms the represented object. The photograph made something visible in the painting that Delacroix had not noticed—and could not have noticed—before. This ability of the medium to transform (rather than to just repeat) leads to a third particular: Delacroix looks at the photographed painting in a different manner than he would have looked at the painting itself. As I will argue, photography led to a shift of attention that was responsible for new patterns of reception—that is, for new ways of looking at artworks and thinking about them.

In the nineteenth century, the relation between photography and painting was a fragile and disputed one. Many writers conceded that photography could be a useful aide for painters. But, as the French philosopher and art historian Hippolyte Taine declared in his *Philosophie d'art* in 1865, "no one thinks of comparing it with painting."[3] Of course, we have to read this as a normative statement: Taine did not want photography to be compared with painting. In fact, though, it was being compared to painting *all the time*. It is true, however, that this comparison had turned out unfavorably for photography in the opinion of most writers. And in this respect Taine, as innovative as his thinking might have been otherwise, followed the mainstream argument, which went like this: unlike painting, photography produced absolute exact imitations of the world. And since exact imitation was not the end of art, photography could not be art. At the most, it could be painting's humble servant.

Delacroix's encounter with Rubens in the Galerie Vivienne makes it clear, though, that other more intricate notions of photography existed in the nineteenth century and that the comparison between painting and photography yielded much more interesting questions than whether the latter was art or not. One could say that photography forced painting to explain, maybe for the first time, why it was art at all. Aesthetic principles that had been so far implicit now had to be made explicit. Painting's status was as much at stake as photography's in nineteenth-century debates, and this is one of the reasons artists sometimes sounded so aggressive (Baudelaire's rant against photography in the *Salon de 1859* perhaps being the most notorious example).

At the same time, and maybe even more consequential, photography started to thoroughly change what painting *was*: how it was produced, how it was perceived, and how it was thought about. For this process, a question that seemed to dominate the debate far into the twentieth century—"Could it be art?"—was surprisingly irrelevant. Already in 1931, Walter Benjamin, in his "Small History of Photography," claimed instead that it was the possibility of reproducing artworks photographically that had, historically, the greatest impact: "It is indeed significant that the debate has raged most fiercely around the aesthetics of *photography-as-art*, whereas the far less questionable

social fact of *art-as-photography* was given scarcely a glance. And yet the impact of the photographic reproduction of artworks is of very much greater importance for the function of art than the greater or lesser artistry of a photography that regards all experience as fair game for the camera."[4]

What is so important about this statement is that it allows us to deepen our understanding of the relationship between photography and the more traditional artistic media in the nineteenth century. For Benjamin, then, the main question had to be put in a completely different way: not whether photography was art but "whether the very invention of photography had not transformed the entire nature of art."[5] Only recently have art historians started to take a closer look at the importance of photographic reproductions, both for our modern concept of art and for the emergence of the academic discipline of art history.[6]

Concentrating mainly on photographic reproductions in this chapter—that is, on "art as photography"—allows me to examine some of the effects the new medium of photography had on the "old" medium of painting. As media historians have pointed out, old and new media do not just follow and replace each other; rather, they emulate and reconfigure one another—they "evolve together."[7] The crucial question is, however, on which level these interactions occur. Often, the relationship between the two media has been described as an aesthetic exchange: how photography tried to look like painting (in order to become art), how painting increasingly looked like photography by the end of the nineteenth century ("accidental" arrangements of figures in some of Degas's paintings being an often-cited example), and how each, in reaction, finally developed a distinct, media-specific look.[8] Other scholars have tried to root photography's aesthetics in artistic conventions that had already been developed in late eighteenth-century painting—either to establish photography as "a legitimate child of the Western pictorial tradition," as Galassi put it, or to argue that a "photographic gaze" had already existed in painting long before the invention of photography.[9]

In this chapter, I want to do something different. By asking, "What did photography do to painting?," I aim at more basic levels of interaction between the two media. My claim is, loosely following Benjamin, that some of the most profound changes photography brought about were not visual ones. They had little to do with what paintings looked like but a lot to do with how one looked *at* paintings and with what paintings *were*. The following three sections examine some aspects of this fundamental historical shift. First of all, I look into how photography changed—or promised to change—the relationship between painting and its audience. In the second section, I ask what happened to artworks when they were photographed. As it turns out, some nineteenth-century thinkers conceptualized photography not as a transparent medium but as a "translator" that would transform the paintings. I will argue that this was not always seen as a deficiency but sometimes as an epistemic quality of photography. In the third section, I deal with details in photography and painting. I claim that photography changed what was most important in a picture and what was secondary and that this also altered how paintings were perceived. Eugène Delacroix, the painter

who was so interested in the new medium and who made some of the most interesting observations about it in the mid-nineteenth century, will serve as my "golden thread" for this chapter.

A New Language

Delacroix's encounter in the Galerie Vivienne took place at a time when photography had just started to dramatically change the production and reception of art. The first photographic albums had become available for the public and were appearing in booksellers' windows. They contained sights from all over the world—famous landmarks, landscapes—and reproductions of artworks.[10] Especially after 1850, when paper negatives began to replace daguerreotypes and allowed for cheap prints of the photographic images, a new era for painting seemed to have begun. "How much I regret," Delacroix wrote to his fellow painter Constant Dutilleux in 1854, "that such an admirable invention comes so late." The possibility of doing studies after photographs would have had an immense impact on his artistic development, he assumed.[11]

Dutilleux, in his reply to Delacroix's letter, saw the "death of *chic*" and of all mannerisms as an immediate result for the present. Yet in the future, photography would provide more certainty—"une direction plus certaine"—for art in general. "This invention," he wrote, "will be a link between the artist and the art lover [*amateur*], a common language for both, a neutral ground on which each will be able to build—one to produce, the other to appreciate."[12] Much more than just an additional reproduction technique, photography, Dutilleux expected, would transform art at its core.

There is a strong sense in the correspondence between Delacroix and Dutilleux that with photography, a major shift is coming that will change the relationship between artists and the public—and of which the consequences are yet unpredictable. The question whether photography itself can be considered art or not is of no particular interest for Delacroix and his colleague, but they agree that the traditional arts such as painting will be altered and will benefit from it. So what exactly did Dutilleux mean when he called photography "a common language" for the artist and the art lover?

To answer this question, we have to consider the conditions of art reception before photography, as well as the changing role of the artist in society in the nineteenth century. Far into the century, art reception meant almost exclusively looking at *reproductions* of artworks.[13] Admittedly, since 1737 the Salon in Paris had allowed a broader audience to see the newest artistic productions before they vanished in private or national collections.[14] And in the second half of the eighteenth century, the first museums opened to the public. But even after that, most of the paintings and sculptures were inaccessible, either belonging to private collections or scattered too widely. Making a Grand Tour through Europe to see the most famous works of art was something only very few people could afford. Direct comparisons between pictures, as we are used to today when curators are able to gather large parts of the oeuvre of Van

Eyck or Rembrandt in one place, were unthinkable. And even somebody who could afford to travel had to resort to copper engravings if he didn't want to rely on just his memory. Before trains and cameras existed, when most works from art history were known only as engravings, art appreciation obviously worked in a completely different manner.[15]

In the nineteenth century, good engravings were still expensive, and they covered only a fraction of the existing artworks. It is easy to see the promise of photography in this regard: a much broader audience would be able to afford many more reproductions. They would be able to know more artworks, to compare them to each other, and to appreciate them in novel ways. As a "universal language," a critic noted in 1854, photography would "multiply and popularize the masterworks of art, and thus put the sum of beauty within reach of everybody."[16]

However, it was not only beauty that was to be divulged. When we think of the new role of the artist as the "avant-garde" of society in the early nineteenth century, the importance of means of reproduction becomes even more obvious. Political thinkers such as Henri de Saint-Simon, Charles Fourier, and Gabriel Désiré Laverdant had discovered the artist as the "man of imagination" and attributed to him an important role in the formation of social change. "Things should move ahead with the artist in the lead," Saint-Simon had written in 1820.[17] As Matei Calinescu has pointed out, the artist was, to Saint-Simon and his followers, capable "not only of foreseeing the future but also of creating it."[18] When art was thought to be the most effective means to reach the minds of the people, to divulge socialist ideas, and therefore to "achieve the most vivid and decisive kind of action," as Olinde Rodrigues had declared, then one of the biggest obstacles was indeed how to *get* the artworks to the people.[19]

It may come as no surprise, then, that photography was so enthusiastically welcomed by some artists and art critics. A century before Malraux, they saw a *musée imaginaire* arriving, as did Louis Figuier in his *Salon de 1859*: "Since photography provides the means to reproduce all pictures [*tableaux*], one of the most useful applications of this kind of operation is to compile, by perambulating the different museums of Europe, *facsimiles* of the oeuvres of great masters to build a sort of popular collection that everyone can acquire."[20]

It is not so important if a writer like Figuier or a painter like Delacroix was close to Saint-Simonian thought (Delacroix, in fact, was). Rather, such thoughts had changed in a more general way how art's relation to society was perceived.[21] If art was to have an important function in society, a "common language" for the artist and the public was very much what was needed.[22]

The Sun, a Most Capricious Worker

But if photography was indeed a "new language," it obviously required a process of translation from the traditional idioms of art. In an article for the *Revue des*

Deux-Mondes, Delacroix called the daguerreotype a "translator," responsible for initiating us into the "secrets of nature."[23] And four years later, in the already cited letter to Constant Dutilleux, he wrote that photographs were "the palpable demonstration of the true design of nature, of which otherwise we have only very imperfect ideas."[24]

7.2 R. J. Bingham, photographic reproduction of Paul Delaroche's *Napoléon à Fontainebleau*. From *Oeuvre de Delaroche* (Paris: Goupil et Cie, 1858), plate 46. Getty Research Institute, Los Angeles (92-F167).

Nothing less than "the truth" is at stake here. According to Delacroix, photography uncovers the "true design" of nature—and, as his encounter with Rubens in the Galerie Vivienne confirms, also of paintings. At a time when both philosophy and physiology had maintained that the human senses were unreliable, or even intrinsically unable to provide information about the real world behind its "appearances" (we have to remember that Kant's *Critique of Pure Reason* was published only a few decades before the daguerreotype was invented), photography seemed to be able to access hitherto inaccessible phenomena.[25] This was certainly one of photography's most powerful promises. It is therefore significant that we find in Delacroix's writings a sense that photography does not simply repeat the world as it is but *reveals* something in it. In this respect, the metaphor of translation is quite telling: the beauty of a good translation being that, though it completely transforms the object (in a translated text, there might not be a single word that stays the same), the original object is still somehow kept intact. Moreover, something might emerge in a translation that had not been noticeable in the original but that was somehow—mysteriously—there. Before photography, the metaphor of translation had been routinely used for another means of image reproduction: engravings.[26] Its application to photography by Delacroix and others shows that something else was expected from photography than to just "reproduce" nature or works of art.

One of the characteristics of photography as a translator was that the results were often unpredictable. For art reproduction, this was especially true. In 1858, Théophile Gautier reviewed the recently published large-format reproductions of the works of Paul Delaroche. Gautier, editor of the journal *L'Artiste* and one of the most eminent

figures in the intellectual circles of mid-nineteenth-century Paris, argued against the "bourgeois prejudices" usually associated with photography, such as impartiality, exactness, and objectivity. Whoever imagined photography as a mirror that only copied was completely mistaken, Gautier stated. "The sun is a more capricious worker than one thinks; often he refuses to do what one demands of him, and his rays have an aversion to rendering this or that color. But he enjoys such a reputation for impartiality that nobody suspects him. This divine sun is not always right, though, and sometimes lies like a human being!"[27]

However, in the case of art reproduction, lies were sometimes just what was needed. Mediocre pictures were transformed by photography into beautiful paintings that would surprise even their creators—such was Gautier's pointed remark regarding some of the reproductions of Delaroche's paintings. Photography, he continued, was itself an artist, *interpreting* the canvases that were put in front of it.[28] At a time when Delaroche's art was often considered to be cold, dry, and dead, the new medium almost seemed to give new life to his pictures.[29]

Behind this ironic rhetoric was the widespread belief that photography would, in the end, separate "great" art from unimaginative, merely technical painting.[30] Not only would it make them discernible from each other; it would also render the latter superfluous. In this sense, the Belgian history painter Antoine Wiertz welcomed it as "good news for the future of painting."[31] Soon, he imagined in 1855, the "artistic genius" could collaborate with photography, leaving all questions of execution to the technical medium while concentrating himself on the process of invention. In Wiertz's vision, the future of photography and the future of painting were inseparable.

Arguably, this very question, whether photography was an "imitator" or a "translator," was *the* determining factor in nineteenth-century debates about the medium and its potentials. We can still find this question, with slightly different terminology, in twentieth-century discussions about photography's alleged transparency. Starting with André Bazin's claim that "the photographic image is the object itself," philosophers and historians have discussed whether the photographic medium is, as Kendall Walton argued, a "supremely realistic medium" that can best be described as "transparent."[32] It seems, though, that the more interesting thinkers of the nineteenth century already had an answer to this question. The object as it was known and its photographic image were very different from each other, and thus the photographic medium was far from being transparent. To understand this not as a fault but as one of the epistemic qualities of photography, was the great intellectual achievement of Gautier, Delacroix, and some of their contemporaries.

The Epistemic Burden of the Detail

It is remarkable how differently beholders in the nineteenth century looked at photographs compared to paintings. From contemporary accounts, we know that it was

mainly the hierarchy of the main and the minor elements in a picture that was disturbed by the new medium. "The margin of the picture is as interesting as the center," Delacroix wrote about photographs in his *Journal*, and "the accessory is as essential as the main thing; very often, it presents itself at first and offends the view."[33]

Here, of course, Delacroix is comparing photographs with paintings; in the mid-nineteenth century, elements on the border of the canvas would generally not be as important as those in the center, and the main parts were easily discernible from insignificant details. In fact, Baudelaire had established in 1846 the *Théorie des sacrifice*, claiming that the most important trait of great art (such as Delacroix's) was that it sacrificed detail to the whole: "The important thing is to concentrate attention particularly on masses."[34] The proponents of photography were quick to assert that photography could do the same and was very much capable of suppressing detail.[35] But it is hard to deny that from the very beginning, it was the details—and the most accidental ones to boot—that captured the attention of the beholders of photographs. Delacroix's astonishment at the sight of the small, "offending" accessories, which obstructed his view and demanded his whole attention, shows just how much photography changed perception.

We can see that change in another episode that happened in 1839. A few months before photography was introduced to the French public, the famous natural scientist and explorer Alexander von Humboldt visited Daguerre's atelier in Paris. Together, they looked at a small daguerreotype showing the inner courtyard of the Louvre. There is straw in the air, Daguerre said to Humboldt; a hay wagon has just passed on the quay. Can you see it on the image? No, said Humboldt. "He gave me a loupe," Humboldt writes, "and there were glowing straws hanging from all windows. . . . One could discern in the image that in a skylight (and what minuteness!!) a pane was broken and had been glued together with paper."[36]

A striking shift of attention becomes apparent in this report. No one in Paris in the year 1839 would have cared about straws flying around or paper-repaired window panes—but in photographic images, such tiny everyday banalities caused a sensation the whole city would soon talk about. The beholders crouched over the images with magnifying glasses, admiring distant advertisements that were only just readable, the texture of cobblestones on roads, or shoeshine boys who had randomly been captured by the camera.[37] "The instrument chronicles whatever it sees," Daguerre's British rival William Henry Fox Talbot wrote a few years later in his *Pencil of Nature*, "and certainly would delineate a chimney-pot or a chimney-sweeper with the same impartiality as it would the Apollo of Belvedere."[38] For Talbot, the fact that photography did not differentiate between important and incidental objects was one of its most remarkable qualities. The public, meanwhile, was by no means as impartial: it was much more interested in chimney sweepers than in the Apollo of Belvedere.

But why were straws and cobblestones, shoeshine boys and chimney sweepers, all of a sudden so interesting when they appeared in photographs? I would argue that with photography, a new class of details came into the world, one that had not existed

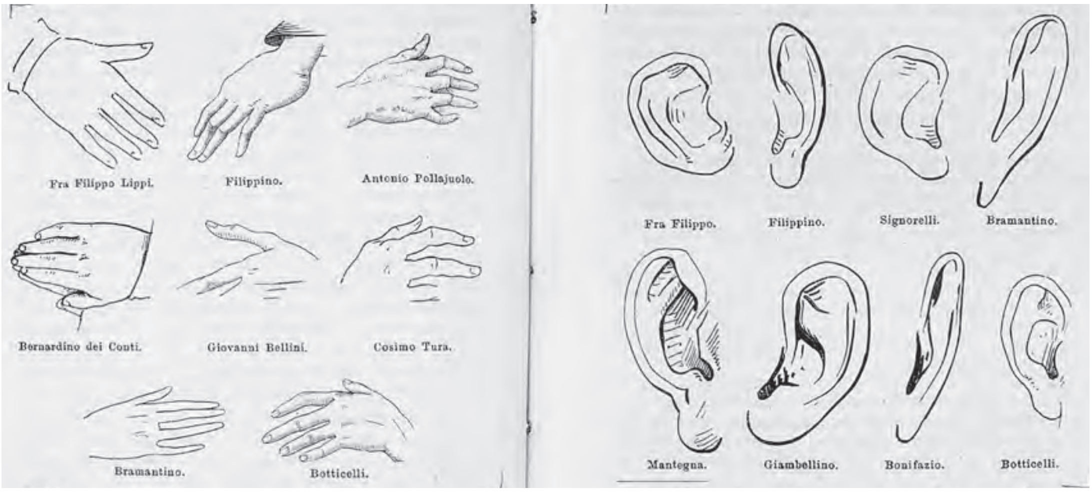
before: the represented, yet unintentional detail.[39] They were very different from all details that readers and beholders experienced before in literature and art, and they had to be deciphered in a different way. A broken window in a novel by Balzac—a writer who was notorious for his detailed descriptions—did not presuppose that a window had actually been broken. And if the painted letter in Jacques-Louis David's *Death of Marat*, written by the murderer Charlotte Corday, had traces of blood on it, no one expected that the real letter actually exhibited such traces. Such details could condense much more complicated historical events and were indicative of the imagination and talent of the artists. Represented details were always intentional, and they referred as much to their authors as to their more or less fictional worlds.[40]

With photography, countless details appeared that were representational but lacked any intention. The photographer admittedly placed the camera, chose the frame, and made many more decisions—but the single straw, the broken window, "a distant dial-plate," "or printed placards most irrelevant" (Talbot) came into the picture without his intention (or even his knowledge). "It frequently happens," Talbot remarked, "—and this is one of the charms of photography—that the operator himself discovers on examination, perhaps long afterwards, that he has depicted many things he had no notion of at the time."[41] Nonintentionality was the most crucial characteristic of this new class of details, because it rendered them legible in hitherto unknown ways: they revealed something about the world, just as the straws had revealed to Humboldt that a hay wagon had just passed by even though it was not visible in the image. Photographic details thus were ascribed an epistemic potential that represented details had never had before.

Now, something remarkable—and important for the question of what photography did to painting—happened in the course of the nineteenth century: this shift of attention toward details and secondary elements that we can notice in early writings about photography was transferred somewhat to the real world. The epistemic potential associated with photographic details was now more and more ascribed to tiny details in general. Marginal elements that had been considered irrelevant before suddenly arrested all the attention of beholders. In criminology, in historical sciences, and in psychology, the detail had to carry an ever heavier epistemic burden.[42]

The world now became readable through the tiniest involuntary details. Conan Doyle's Sherlock Holmes solved murder cases by paying attention to carelessly left cigarette stubs. Not only in literature but also in real life, the details were supposed to reveal who had committed a crime or what was hidden in a person's subconscious. Surely photography was not the only trigger for this new epistemological model, but it was perhaps an important factor in the reassessment of the detail.

Carlo Ginzburg has shown how this "evidential paradigm" also changed the way art was perceived.[43] He describes how toward the end of the nineteenth century involuntary details were looked for (and found) in paintings. In the 1870s, the Italian art writer Giovanni Morelli developed a method—still known today as the Morelli method—that aimed at identifying beyond doubt the authorship of artworks. It was



7.3 The science of detail, in Giovanni Morelli, *Kunstkritische Studien über italienische Malerei* (Leipzig, 1890).

necessary, Morelli argued, to concentrate on the tiniest and most marginal elements of a painting: figures' ears and hands, for example. According to him, such details revealed the artist's characteristics most distinctly. "You must not lose patience," Morelli wrote, "if I detain you with what may appear to you trivial and even absurd. It is my object to make you notice everything in a work of art, and in time you will come to see that even details, in themselves insignificant, may lead us to the truth."[44]

"Insignificant details" were now what was potentially most significant in paintings. It was photography, though, that had already trained the eye to "make notice of everything," however unimportant any one detail may have appeared at first. The hierarchy of center and margin, of "l'accessoir" and "le principal" (Delacroix), had been thoroughly disturbed.

Conclusion

In November 1893, forty years after Delacroix looked at Rubens in the Galerie Vivienne, an article in the *Nation* informed its readers about new achievements in the photographic reproduction of paintings. So-called isochromatic plates were finally able to render all parts of the light spectrum—what the human eye perceived as colors—in adequate gray shades. Older emulsions had been notoriously unreliable: some dark colors, such as blue, were represented in light-gray tones on photos, while lighter ones, such as yellow, came out very dark. It was thus almost impossible to infer the original colors of a painting from its photographic reproduction. Bernard Berenson, art historian and author of the article, therefore welcomed the new emulsions enthusiastically. He also took the opportunity to remind his readers of the advantages the

new medium of photography had, in its almost half century of existence, brought to art. In Berenson's view, photography's effect on the study of old masters could not be rated too highly. Photography had made accurate comparison of paintings possible for the first time, and since comparison was the basis of all connoisseurship, it had in fact made true art-historical research possible. Giovanni Morelli's "overwhelming superiority" to his predecessors had, according to Berenson, exactly one reason: he was the first to make systematic use of photographic reproductions for his studies. "Really accurate connoisseurship," Berenson concluded, had been impossible in "the days before railways and photographs."[45]

Today, we do not believe as much in connoisseurship as Berenson did, neither as a method nor as an end of art history. But his insight that painting is highly dependent on other media is as pertinent as ever. It would indeed be an intriguing thought experiment to imagine what painting (and, more generally, art) would be today if photography had never existed. How would we access paintings? Which ones would be famous and expensive? Would painting play the same role in our culture? A substantial part of what we know (or think we know) about painting is related to us by photographic means. Photography took part in the formation of our canon of "great masters" and shaped the art-historical concept of *Stilgeschichte*, a notion based on formal comparisons that would have been impossible without readily available reproductions. But perhaps even more importantly—and this is what I wanted to show in this chapter—it transformed painting at its core. As Robin Kelsey recently put it, "Photography changed what pictures could be."[46] This change did not take place merely on the visual surface; it took place on deeper, more substantial levels, and it affected how paintings were produced, perceived, and conceptualized.

Of course, to get a fuller picture of the interactions between photography and painting, we would have to take other aspects of this lively relationship into consideration: economic ones, for example. And we would have to ask the reverse question: What did painting do to photography? For now, it must suffice to acknowledge that photography's and painting's histories are deeply indebted to each other.

Notes

1. Pach, *Journal of Eugène Delacroix*, 350.
2. See Damisch, *Peinture en écharpe*.
3. Taine, *Philosophy of Art*, 36.
4. Benjamin, "A Small History of Photography," 253.
5. Benjamin, "The Work of Art," 227.
6. See, e.g., Roberts, *Art History*; Bann, *Parallel Lines*; Bann, *Art and the Early Photographic Album*; Matyssek, *Kunstgeschichte als fotografische Praxis*; Didi-Huberman, *L'album de l'art*.
7. Balbi, "Old and New Media."
8. See, e.g., Schwarz, "Kunst und Photographie"; Newhall, *History of Photography,* esp. 119–38; Scharf, *Art and Photography*. A recent example of such a narrative is provided in Planchon-de Font-Réaulx, *Painting and Photography*.
9. Galassi, *Before Photography*, 12; Geiger, *Urbild und fotografischer Blick*.
10. See Jammes, *Blanquart-Evrard*. See also the essays in Bann, *Art and the Early Photographic Album*.
11. See Hanoosh, *Painting and the Journal of Eugène Delacroix*, 82.

12. Letter from Constant Dutilleux to Delacroix, April 29, 1854, cited after Leribault, *Delacroix et la photographie*, 148.
13. See Verhoogt, *Art in Reproduction*; Ullrich, *Raffinierte Kunst*.
14. Crow, *Painters and Public Life*; Kernbauer, *Der Platz des Publikums*.
15. See Berenson, "Isochromatic Photography."
16. Caloine, "De l'influence de la photographie," here cited after Rouillé, *La Photographie en France*, 184.
17. Saint-Simon, *Lettres de Henri Saint-Simon*, here cited after Calinescu, *Five Faces of Modernity*, 102.
18. Calinescu, *Five Faces of Modernity*, 102.
19. Cited after ibid., 103.
20. Figuier, *La photographie*, 48 (my translation).
21. For the paradoxical trait that art was conceived as autonomous—and therefore (since Kant) "without a purpose,"—but nonetheless had an important function for society, see Bürger, *Theory of the Avant-Garde*.
22. Of course, there were as many negative expectations about the effect of photographic reproductions of artworks on society as positive ones; see, e.g., Baudelaire's famous attack on photography (Baudelaire, *Salon de 1859*).
23. Delacroix, "Le dessin sans Maître," 1143.
24. See Hanoosh, *Painting and the Journal of Eugène Delacroix*, 82.
25. See Levitt, "Biot's Paper and Arago's Plates"; Keller, *Brought to Light*.
26. Le Men, "Printmaking as a Metaphor for Translation." See Bann, "Der Reproduktionsstich als Übersetzung."
27. Gautier, "L'œuvre de Paul Delaroche photographié." See Wolf, "Es werden Sammlungen jeder Art entstehen"; Boyer, "Robert J. Bingham."
28. One important reason for this interpretive faculty of photography was its specific sensitivity to the electromagnetic spectrum, which, until the end of the nineteenth century when orthochromatic plates were invented, was very different from the sensitivity of the human eye. See Haworth-Booth, "Camille Silvy." See also Brevern, "Die Wissenschaft vom Verzicht."
29. See, e.g., Mantz, "L'œuvre de Paul Delaroche," 71.
30. See, e.g., Wey, "De l'influence de l'héliographie."
31. Wiertz, "La photographie" (1855), reprinted in Rouillé, *La photographie en France*, 244–45.
32. Bazin, "The Ontology of the Photographic Image"; Walton, "Transparent Pictures." See also Kind, "What's So Transparent About Transparency?" A résumé of the debate can be found in Elias, "The Relationship Between Painting and Photography."
33. Delacroix, *Journal*, September 1, 1859, cited after Rouillé, *La Photographie en France*, 270.
34. Baudelaire, "The Salon of 1846," 56.
35. See Mondenard, "Entre romantisme et réalisme"; Parise, "Visages 'mangés' par les details."
36. Alexander von Humboldt, letter to Carl Gustav Carus, February 25, 1839, here cited after Siegel, *Neues Licht*, 85.
37. For the role of details in the history of photography, see Kemp, *Theorie der Fotografie*, vol. 1, 13–24; Peter Geimer, "Blow Up"; Gunthert, "La boîte noire de Daguerre"; Starl, *Kritik der Fotografie*.
38. Talbot, *The Pencil of Nature*.
39. See Kelsey, *Photography and the Art of Chance*.
40. An exception is so-called accidental images; see Gamboni, *Potential Images*. The details in these images are also represented *and* unintentional, but unlike photographs, they usually do not establish a reference.
41. Talbot, *The Pencil of Nature*.
42. See Weigel, *Literatur als Voraussetzung der Kulturgeschichte*, 15–62.
43. Ginzburg, *Clues*, 96–125.
44. Morelli, *Italian Painters*, 46–47.
45. See Berenson, "Isochromatic Photography," 346.
46. Kelsey, *Photography and the Art of Chance*.

{ 8. }

Uniqueness Multiplied

The Daguerreotype and the Visual Economy of the Graphic Arts

STEFFEN SIEGEL

The history of photography is always also the history of "other" media. From the very beginning, the appropriation and reception of photographic images has been framed within the larger field of the fine arts. Photographic images were not experienced and discussed in their own terms. Rather, they were compared to and associated with other media and practices of visual representation that were more familiar to the public.[1] Within such a transmedia context, key questions emerged about the status and the meaning of the photographic image. What artistic value was attributed to this novel form of imagery? How did photographic plates differ from paintings, drawings, and prints when it came to translating reality into an image? Would the traditional arts benefit from this innovation, or would they suffer from it?

This chapter looks at why and how these questions were raised. Shortly after the introduction of photography, reflections about the use and value of photographic practices were part of a cultural context in which intermedia comparisons were constantly and consistently at stake. As a consequence, conventional understandings of other older media are of crucial importance in coming to a better understanding of what was meant by "photography." As several historians have shown, the impact and reception of a new medium can only be understood within the broader context of other media forms and practices.[2] From the very beginning of the history of photography, definitions and understandings of the new medium originated within a field of intermedia relationships, of the "own" and the "other." Focusing on discussions

accompanying the publication of an early attempt to convert photographic images into graphic reproductions—namely, Lerebours's *Excursions daguerriennes*—this chapter explores some of the complexities and implications of this relationship. By bringing Lerebours's writings into dialogue with a review by an early critic of his work, Rodolphe Töpffer, I will show what emerges from such a debate: a hybrid and highly contradictory field where the boundaries between different media are constantly erected and destroyed at the same time.

On Photography and the Other: Rodolphe Töpffer's Review

The Swiss illustrator and writer Rodolphe Töpffer had much more on his mind than he could squeeze into one single review. In its March 1841 issue, the monthly journal *Bibliothèque Universelle de Genève* published his article "De la plaque Daguerre" (On the Daguerre plate).[3] The text was conceived as a critical review of the *Excursions daguerriennes*, a portfolio of aquatint engravings taken from daguerreotypes, which had started to come out in Paris the previous year and was edited by Noël Lerebours.[4] Yet not one of the thirty-two pages of Töpffer's article specifically mentioned Lerebours's portfolio. Instead, the article seemed to take the entire graphic arts into view. Arguably, it was not an individual publication that Töpffer meant to review but rather an intermedia relationship that, since the publication of the first photographic procedures in 1839, had been gaining ever-increasing significance: the relationship between the traditional fine arts and photographic images.[5]

Töpffer's text was driven by those fundamental questions I mentioned above. His answer was unequivocal: from his perspective, the daguerreotype did not add anything to the fine arts. Even more, a comparison between the arts and photography degraded the artist by equating him with a machine. Driven by one chief purpose, the Swiss critic delved into a comparative aesthetic: playing off the merely mechanical nature of the photographic procedure against artistic *ingegno*. Töpffer recognized that all forms of image creation presupposed a mimetic principle. But while the painter, the draftsman, and the graphic designer worked toward the expression of poetry and individualism, the photographer was left with mere imitation, which came to its end at the very point where the work of the fine arts began.[6]

Töpffer's article came out a little more than a year and a half after the publication and public presentation of the daguerreotype.[7] During that time, all the issues had come into view that would play an important part for Töpffer. When the French painter Paul Delaroche set eyes on a daguerreotype for the first time, the legend of photographic history has it that he exclaimed, "From today, painting is dead." Although the written evaluation of the daguerreotype that the very same Delaroche produced in June 1839 at the request of Daguerre's intercessor Arago speaks a much more balanced language,[8] the later reception of Delaroche's pseudo-quote tells us something about the ways in which new media are perceived and processed: what is

new implies something older. Photography presupposes existing and preceding visual media. It seems to be part of this logic of comparison to identify winners and losers in the end.[9] While Delaroche's alleged words saw photography as winning the day, a critic such as Rodolphe Töpffer felt entitled to assume the very contrary. In daguerreotypes he saw no more than the mere identity of what was visible anyway. Instead of an intelligently saturated and artistically rendered likeness, he observed nothing but material repetition.[10] Only a few months after the first installment of the *Excursions daguerriennes* appeared, the Swiss reviewer sat before this large-format portfolio and took its title much too literally. His criticism aimed at understanding the "excursions" suggested by Lerebours as "ex-cursions" or digressions, which had gone astray from the proper aesthetic path and fatally left the territory of the fine arts.

It is worthwhile to imagine the reviewer leafing through the portfolio. With Lerebours's *Excursions* in view, quill in hand and normative concepts of the traditional fine arts in mind, Töpffer wrote about and against the "plaque Daguerre." Only one thing is missing in the scene: a daguerreotype. While it is not possible to know for sure, much supports the assumption that Töpffer's article is indebted to an interaction with reproductions of photographic images rather than original daguerreotypes. As his subtitle specifies, his work is "À propos des *Excursions daguerriennes*"—it is *about* the daguerreotype, thus making use of it without presenting it itself. The *Excursions* are composed of graphic representations of photographic representations. They transform Daguerre's invention into an adjective, expose it prominently in the title of the portfolio, and are, to a significant degree, both close to and far from these images. By virtue of this very fact, however, they raise far-reaching issues regarding the visual economy of the graphic arts.

An Extension of the Graphic Arts: Lerebours's *Excursions daguerriennes*

As the daguerreotype became a public matter in August 1839, the optician Noël Marie Paymal Lerebours was among the first businessmen to seize the opportunity. The store opened by his adoptive father, Noël Jean Lerebours, in 1789 at Place du Pont-Neuf had long been among the key Parisian addresses for the production and distribution of optical instruments. In June 1839, only weeks before the publication of his photographic procedure, Daguerre signed a contract with another Parisian optician, Alphonse Giroux, designed to secure him the exclusive rights to market daguerreotypes.[11] This did not deter competitors such as Charles Chevalier, ironically Daguerre's longtime supplier; the brothers Nicolas and Victor Susse; or, finally, father and son Lerebours from quickly pushing into the market with their own photographic apparatuses and equipment for the production of daguerreotypes. When the father passed away in the following year, the son took over the well-established business. At that time, Noël Lerebours was only thirty-two years old, and he seems to have decided to make the daguerreotype his main concern. For the young businessman, both aesthetic

and commercial interests came together in the daguerreotype. If one is to believe his own words, he accumulated a collection of more than twelve hundred daguerreotypes within just a few months.[12] It would have consisted mostly of views of Paris and sights from different countries. As Marc Antoine Gaudin reported,[13] the collection was a well-known attraction in Paris. It might have also convinced the curious crowd gathering in Lerebours's store to invest what was at the time a considerable sum into the making of their own daguerreotypes.

But Lerebours's business acumen and sense of mission far exceeded the limited scope of his shop at Place du Pont-Neuf. From 1840 onwards, based on his photographic collection, the optician produced a portfolio of engravings that, under the title *Excursions daguerriennes*, quickly became a remarkable commercial success.[14] Lerebours was neither the first nor the only one to take up the idea of publishing photographic views of locations near and far in book form.[15] But he was certainly the one who dedicated himself to that idea with the most energy. Lerebours had produced only the smallest part of his collection of daguerreotypes himself. For the most part, he fell back on pictures that travelers had made on his behalf or that they offered to him for purchase.[16] The portfolio's subtitle makes it clear: this collection of prints aimed at nothing less than the most remarkable views and monuments of the entire world—"les vues et les monuments les plus remarquables du globe."

Just two years before, in a leaflet advertising his photographic procedure, printed in the fall of 1838 but probably never distributed, Daguerre had mentioned the idea of disseminating daguerreotype plates through invited subscriptions.[17] Without any knowledge of drawing, chemistry, or physics, he was convinced that the most picturesque scenes could be captured. Especially in the sunny south, with its favorable lighting conditions—in Spain, Italy, or Africa—Daguerre was sure that this procedure would be able to unfold its full effect. "L'Espagne, l'Italie, l'Afrique, etc., etc."[18]—it seems as if Noël Lerebours wanted to take Daguerre's indications literally. Indeed, the largest part of the views he selected for the first installments of *Excursions daguerriennes* followed this geographic direction, satisfying viewers' interest in distant regions outside of France. In addition to views from Switzerland and Germany, Great Britain, and Russia, he chose some from Italy, Greece, Egypt, the Ottoman Empire, and Palestine. He even presented a view of Niagara Falls (fig. 8.1) in the first edition of his *Excursions*. As he explained in a footnote, Lerebours used a daguerreotype as well as a written eyewitness account.[19]

A closer look reveals that there are two different collections behind the name *Excursions daguerriennes*: on the one hand, Lerebours's collection of photographic images, a small part of which he himself produced as a photographer; on the other hand, the series of engravings that the editor himself referred to as "Collection" on the cover page, and that grew from 1840 up to a two-volume portfolio. The effort that Lerebours invested, but also the continuity and high quality that he gave to this printed collection, remain remarkable. For each of the images, always in large format, the editor provided a detailed explanation that often ran two pages or more. Lerebours

8.1 North America: "Niagara: Chute du Fer à Cheval." Aquatint after original daguerreotype plate by H.-L. Pattinson. From Noël Marie Paymal Lerebours, *Excursions daguerriennes: Les vues et les monuments les plus rémarquables du globe*, vol. 1 (Paris, 1841).

was enough of a businessman to get one of the most famous feature writers in Paris, Jules Janin, to write the first installments.[20] Janin had also covered the events relating to the presentation of the daguerreotype just months before.[21] Overall, within about four years, a brilliant photobook developed that was missing only one important thing: photographs.

The photographic images produced according to Daguerre's procedure were "plates"—that is, three-dimensional objects. Although viewers of daguerreotypes may at first always be interested in the silvery, photosensitive surface of these plates, the aesthetic experience is far more complex. As material objects, they are easy to pick up, and their reflective surface, which can be viewed well only from a certain angle, also suggests such a haptic approach. In order to understand the kind of relationship viewers establish with these object-images, one has to take into account the materiality of a daguerreotype but also consider the viewing of it as an engagement with a three-dimensional body.

We do not know in what manner Noël Lerebours stored and presented his collection, but we can assume an expansive storage room that demanded from its owner a fair

measure of planning.[22] Maybe this is why it seemed obvious to the optician, collecting on a grand scale, to choose a rather traditional solution for the public circulation of his collection. A printed portfolio allowed the viewer to approach the collection in a much more convenient way. Within a few years, Lerebours circulated over a hundred daguerreotypes in the form of his *Excursions*, thereby becoming one of photography's most important propagators. This entailed leaving aside the material nature of the daguerreotype, which represented the very essence of this medium. The foreword to the portfolio proudly proclaimed that the editor was ordering reproductions of the daguerreotypes from leading graphic artists.[23] A few exceptions aside, photographs were presented transposed into aquatints. Pragmatically driven, Lerebours ignored the enormous technological and aesthetic differences between the media. An aquatint—this seemed to be the unspoken assumption of his project—could make itself transparent in relation to the processes of translation.

While William Henry Fox Talbot in England worked early on with original prints for the publication of his calotypes,[24] all those who, like Lerebours, focused on the daguerreotype procedure were precluded from such an option. Not only was it out of the question to apply the metal plate carrying the image to a book page, but such an idea was impossible due to the simple fact that each of these plates constituted a unique original. With regard to visual economies, the daguerreotype was therefore from the very beginning both a dead end and a challenge. Any demand for more than one copy of a specific daguerreotype ignored the daguerreotype's materiality and had to be met through creative appropriation.[25] In this context, Lerebours was not interested in emphasizing the difference between a daguerreotype and an aquatint. In contrast to the antagonism that Töpffer saw between these media, he saw the different means of visual presentation as moving in parallel.[26] As such, he understood the "other" of other media in the sense of aesthetic neighborhood within the wide field of the graphic arts, which, through the introduction of photographic procedures, had experienced an "indisputable expansion," to use his words. In fact, not only because of the content represented in the daguerreotypes but also because of their specific graphic aesthetic, Lerebours believed that lovers of the fine arts should be particularly interested in this new image technology.[27] The play of visual economies underlying his serially published edition made use of the mass of collected daguerreotypes to feed them into a publishing circuit whose scope of influence far exceeded that of a unique photographic plate. The process of transcription, in this sense, included the new medium of photography into the larger and older context of the graphic arts.

A Composite Work: Daguerreotype and Graphic Design

In the eyes of a critic like Rodolphe Töpffer, a daguerreotype in the form of an aquatint must have been an absurd hybrid that forced together complete opposites. In the end, "À propos des *Excursions daguerriennes*" aims at this precise point: while an

artist, such as a graphic designer, seeks a pictorial expression that will always remain tied to his individual characteristic style, the photographer remains dependent on the performance of his camera, which is only capable of stolidly reproducing what is visible anyway. Töpffer distinguishes mere "imitation" from poetic "expression," placing them in a hierarchical order.[28] From this same viewpoint, Töpffer would also have distinguished between the value of a graphic reproduction and that of a painting. Such interplays were part of the standard of visual economies.[29] But photography, in Töpffer's delineation of the field of fine arts, had to be excluded for categorical reasons. A visual aesthetic of the machine had no place in the scope of an artist specializing in drawings, such as Töpffer.

The optician Lerebours knew no such reservations. Quite to the contrary, he recognized the opportunity the daguerreotype provided to achieve an image of immediate precision, unaffected by the taste or imagination of a painter or illustrator. What Töpffer dismisses as photography's inherent flaw—being merely mechanical—is of particular interest to Lerebours, in the sense of a mathematical foundation of image production through the apparatus of the camera. Lerebours does not see the camera's mimetic precision as outside of an artistic order and is not convinced that the hand of the artist will be made superfluous by the automatism of technical image production. According to his argument, the image produced by way of photographic recording is only a first point of departure for the subsequent aesthetic production.[30] Just the fact that a daguerreotype can only achieve chromaticity through subsequent coloration entails additional artistic handling of the plates.[31] Another means of supplementation is owed to the long exposure time required by the daguerreotype, whose plates could only record what remained motionless in front of the camera for several minutes. People, such as those who animate a *veduta* of Paris or Venice in the *Excursions daguerriennes*, would have to be added subsequently.

For Lerebours's idea of a collection that compiled "the most remarkable views and monuments in the world," such limitations were hardly relevant. It was the novel aesthetic value associated with a visual trip around the world that was of interest. One can still feel the excitement that must have moved Pierre-Gustave Joly de Lotbinière when, just weeks after the public disclosure of the principles of the daguerreotype, he ascended the Acropolis in Athens to become the first photographer ever to take pictures of the ancient monuments.[32] Lotbinière's short reports, included by Lerebours in his portfolio, effectively convey this pioneering spirit. The fact that his photo campaign ended up focusing on a particular part of the Acropolis, the Propylaea (fig. 8.2), was due to the medium employed: the position of the sun and the lighting conditions made the Propylaea a suitable subject.[33]

Interestingly, the portfolio includes only some of the names of the contributors who were so crucial to Lerebours's enterprise. Joly de Lotbinières, for instance, is quoted in the accompanying text and named as an author but not explicitly identified as the photographer. At the lower margin of the frame, three different authorships are assembled: the graphic designer to the right, the printer in the middle, and to

8.2 Greece: "Les Propylées à Athènes." Aquatint after original daguerreotype plate by Pierre-Gustave Joly de Lotbinière. From Noël Marie Paymal Lerebours, *Excursions daguerriennes: Les vues et les monuments les plus rémarquables du globe*, vol. 1 (Paris, 1841).

the left, an entry running through the entire portfolio: "Daguerréotypie Lerebours." This entry, the first in reading order, must be interpreted in the sense of an ownership note. But on the page, one looks in vain for an indication of the photographer responsible for each shot.[34] Thus, the "other media"—here especially the aquatint and in some cases the lithograph—remain dominant in relation to photography. In regard to authorship, the photographic capturing of a *vue* is not yet accorded autonomous status.[35]

Such intricacies did not interfere with the commercial success of the portfolio. Quite to the contrary, Lerebours was encouraged by its success to publish a second series of installments. In the foreword to his *Nouvelles excursions daguerriennes*, the editor raves about the previous volume, calling it the most powerful proof that the new instrument was capable of ruling over light.[36] However, Lerebours does not mention that his numerous customers had not purchased a single photograph but only a collection of aquatint reproductions after photographs. His goal was a rendition style that, in accordance with his conviction, was capable of going beyond the differences

8.3 Italy: "Vue prise de la Piazetta à Venise." Aquatint after original daguerreotype plate by an unknown photographer. From Noël Marie Paymal Lerebours, *Excursions daguerriennes: Les vues et les monuments les plus rémarquables du globe*, vol. 1 (Paris, 1841).

between various graphic technologies. In his view, the aquatint, used almost uniformly in the *Excursions*, particularly matched the daguerreotype's refinement and precision.[37] The adjective *daguerrienne*, so prominently featured on the cover page of each installment, appeals to a style of perception and rendition whose essential features are strict correctness ("la justesse rigoureuse") and immediate precision ("la précision soudaine"). Indeed, Lerebours's use of Daguerre's name as a trademark for a style of authenticity and immediacy was just a very early example of a use that would continue for much of the nineteenth century.[38]

A closer view reveals a paradox at work behind this idea of strict correctness that Lerebours associated with the daguerreotype. In both volumes of the *Excursions*, the daguerreotypes are not only presented in the form of another medium. As explicitly addressed by Lerebours, the incompleteness of the daguerreotype, owing to the still too long exposure times, is compensated for by its transcription as an aquatint. These graphic reproductions are therefore completed with elements of nonphotographic

origin. Yet Lerebours emphasizes that even the scenes supplementing the photographic image were sketched at the very place where the photograph was taken and could thus apparently also claim authenticity.[39] This especially concerns the staffage figures that are often found in the foreground of the *vedutas* and were probably meant to convey an additional narrative and at times an exotic charm. The view of the Piazza San Marco in Venice (fig. 8.3), for example, shows several groups in the foreground of the image. While Nachum Tim Gidal finds the staffage figures in the view of the Porto di Ripetta in Rome so true to life that he wants to believe they were actually captured photographically,[40] such an interpretation has been convincingly rebutted.[41]

While such discussions have focused on obvious interventions in the photographs, the clouded sky over the Venetian lagoon is just as surely the result of a supplementary intervention. The photosensitivity of the daguerreotype was much too irregular to capture the full values of the color spectrum visible to the human eye within a common exposure time. This was particularly evident when the photographers working for Lerebours left the urban space. Thus, in his comments on two such prints—*Vue prise en Normandie. Paysage* and *À propos d'une vue prise à Bas-Meudon*—Pierre-Joseph Challamel emphasized the preliminary character of any daguerreotype. But, Challamel argued, this is exactly why this form of technical image production was open to constant improvements, in terms of both technical progress and the hand of the intervening artist.[42] It is especially with regard to renditions of nature that the issue of motion blur becomes of particular interest. A daguerreotype of Niagara Falls or the waterfalls of Tivoli would certainly have displayed all the indicators of motion blur. In their reproductions, graphic designers compensated for such flaws. To Challamel, such a "fac-simile de la nature"[43] could well count as a composite work of the photographer and the graphic designer. Who to credit, and to what degree, remains a matter of speculation for almost every image from the *Excursions daguerriennes*. Apart from the very few examples where the original plates have since been found,[44] the reality of the aquatint has superseded that of the photograph.

Blurring Boundaries

The prints published by Lerebours, over a hundred in all, are evidence of the continuity with which the *Excursions daguerriennes* were produced over the years. Against this background, an "Avis aux souscripteurs," which the editor probably composed in 1841, is all the more noticeable. The series of installments, it says, had been held up, leading to numerous complaints. But the audience apparently also complained about a certain monotony in the *Excursions*, both in their content and in their graphic implementation. Lerebours's customers not only demanded more than city views; they also apparently suggested using lithographs as an additional medium of reproduction, thus enabling a greater diversity of renditions. Lerebours indeed followed this suggestion by including a small number of lithographs in his portfolio. But a real shift in the

8.4 France: "Un des bas-reliefs de Notre-Dame de Paris." Etching ("Épreuve de daguerréotype transformée en planche gravée—procédé Fizeau") after original daguerreotype plate by an unknown photographer. From Noël Marie Paymal Lerebours, *Excursions daguerriennes: Les vues et les monuments les plus rémarquables du globe*, vol. 2 (Paris, 1843).

relationship between photographic plate and graphic reproduction required something different. Was this the actual motive for Lerebours's address to his subscribers? It seems that in 1841 the time had come for such a shift in the structure of visual media.

In fact, in the fall of 1839, right after the publication of the technological basics for the production of daguerreotype plates, Alfred Donné had started experimenting with photographic plates. He soon succeeded in engraving them so that they could be used as printing plates.[45] Despite vigorous protest from Daguerre, who saw the principles of his invention as being reduced to absurdity,[46] Donné's example set a precedent. Soon several inventors at once—among them Joseph von Berres, Albrecht Breyer, and William Robert Grove—took up the idea and developed it in different ways.[47] Apart from the experiments of von Berres, who was based in Vienna, those of the French physicist Hippolyte Fizeau were particularly promising.[48] Only eight days after Fizeau presented his results to the Académie des Sciences in Paris, Lerebours wrote in his letter to the subscribers that he had taken up the physicist's procedure for the *Excursions daguerriennes*.[49] Thus, his clients would actually have been the first ones, outside a small circle of Parisian photo specialists and scientists at the Academy, to inspect an example of the new reproduction technique.[50]

Lerebours would eventually produce three such prints after the *Procédé de Fizeau.* Apart from the bas-relief from Notre-Dame Cathedral in Paris (fig. 8.4), these include a view of the Paris city hall (fig. 8.5) and the Maison Elevée in rue St. Georges (fig. 8.6). From the point of view of media technologies, these three sheets unquestionably form the most extraordinary panels within the *Excursions daguerriennes*. In fact, what Lerebours's clients got to see here was in question more than ever. The rendition strategies used in this portfolio can be interpreted overall as an exploration of the space that opens up between the daguerreotype and other graphic visual media. In these three examples produced after the *Procédé de Fizeau*, this space narrows in a dramatic manner, so that finally the two converge on a single point. The copy of a daguerreotype produced by way of galvanoplasty—a chemical method for producing facsimiles of metal plates and objects—is taken as the basis of a reproduction that carries all the signs of an automated photographic inscription, but at the same time remains dependent on the manipulation of a graphic designer. Incidentally, it was Lerebours himself who, in the fourth edition of his *Traité de photographie* from 1842, would explain the details of this complicated copying and printing procedure.[51]

When Rodolphe Töpffer published his article "De la plaque Daguerre" in March 1841, he could not have known about this development in the field of graphic reproduction of photography. Challamel's words of appreciation for Fizeau's procedure not long after, however, would have confirmed Töpffer's opinion that the daguerreotype should be met with distrust. In his text on the Notre-Dame bas-relief, not only does Challamel take up the rhetoric of mathematical exactness already employed by Lerebours; he also celebrates the absence of any artistic skill in the use of a

8.5 France: "Hôtel-de-ville de Paris." Etching ("Gravé par le procédé Fizeau") after original daguerreotype plate by an unknown photographer. From Noël Marie Paymal Lerebours, *Excursions daguerriennes: Les vues et les monuments les plus rémarquables du globe*, vol. 2 (Paris, 1843).

8.6 France: "Maison Élevée, Rue Saint Georges par M. Renaud." Etching ("Gravé par le procédé Fizeau") after original daguerreotype plate by an unknown photographer. From Noël Marie Paymal Lerebours, *Excursions daguerriennes: Les vues et les monuments les plus rémarquables du globe*, vol. 2 (Paris, 1843).

daguerreotype, and consequently the processing of the image into a "perfect engraving," as a sign of artistic progress.[52]

The results achieved in this manner are of surprisingly varying quality. While what was apparently the earliest rendering of a bas-relief largely lost the fine structure of the daguerreotype it was based on,[53] the two later renderings display a much greater mastery in the application of the procedure. Insofar as the aesthetic effect of these three sheets can be differentiated, they still pose a common question to the viewers: What exactly is it, from the perspective of media ontology, that here comes into view? Whereas the *Excursions daguerriennes* overall employed a strategy of media hybridization by enmeshing daguerreotype and graphic reproduction,[54] largely executed in aquatint, such a representation on the basis of Fizeau's reproduction procedure is complicated altogether. The essential uniqueness of each single daguerreotype plate is taken as point of departure for a culture of the copy: a culture that aims at producing a perfect simulacrum. Uniqueness is thus approached under the conditions of its ability to be multiplied. Does this blur the boundaries between the graphic and the photographic? The mingling of different visual media in Lerebours's plates raises a question that has lost none of its topicality in the digital age: What, really, is a photograph?[55]

Notes

1. Planchon-de Font-Réaulx, *Painting and Photography*.
2. Gitelman and Pingree, *New Media*; Sturken, Thomas, and Ball-Rokeach, *Technological Visions*.
3. Töpffer, "De la plaque Daguerre."
4. Lerebours, *Excursions daguerriennes*.
5. For a critical edition of related texts, see Siegel, *First Exposures*.
6. Töpffer, "De la plaque Daguerre," 88.
7. Strangely, Töpffer doubles this time span in the opening sentence of his article, citing three years (ibid., 62).
8. Siegel, *First Exposures*, 197–98. Gaston Tissandier most probably introduced it in 1874 to then take its both fatal and successful course through media historiography. Tissandier, *Les merveilles de la photographie*, 64; Lamoureux, "Delaroche et la mort de la peinture"; Bann, "Against Photographic Exceptionalism."
9. Groys, *On the New*; North, *Novelty*.
10. Töpffer, "De la plaque Daguerre," 75.
11. Siegel, *First Exposures*, 189–91.
12. Lerebours, "Avis de l'éditeur," in *Excursions daguerriennes*, vol. 1.
13. Gaudin, *Traité pratique de photographie*, 8.
14. Caraion, *Pour fixer la trace*, 88–108; Roubert, *L'image sans qualités*, 86–89; Stuhlman, "The Daguerreotype Translated."
15. *Album du daguerréotype*; Bajac, Planchon-de Font-Réaulx, *Le daguerréotype français*, 230–34; Philipon, *Paris et ses environs*; Horeau, *Panorama d'Égypte et de Nubie*; Chamouin, *Collection de vues de Paris.* Further bibliographic information is given in Gernsheim and Gernsheim, *L. J. M. Daguerre*, 196–98.
16. Gernsheim and Gernsheim, *L. J. M. Daguerre*, 109.
17. Siegel, *First Exposures*, 34–37.
18. Daguerre, *Daguerréotype*.
19. Lerebours, *Excursions daguerriennes*, commentary to plate *Cataracte du Niagara (Amérique du Nord)*.
20. *Jules Janin et son temps*.
21. Siegel, *First Exposures*, 58–64, 200–201, 205–215, 290–293.
22. Just a few years later, Walt Whitman gave an account of his visit to the New York branch of "Plumbe's Gallery" on Broadway and graphically outlined the expansive effect of such daguerreotype collections. Whitman, "Visit to Plumbe's Gallery."
23. Lerebours, "Avis de l'éditeur."

24. Or, more precisely, Talbot glued his pictures in. Marta Caraion does not consider this early method of photobook production. Caraion, *Pour fixer la trace*, 89.
25. Pinson, "Photography's Nonreproducibility."
26. Bann, *Parallel Lines*.
27. Lerebours, "Avis de l'éditeur."
28. Töpffer, "De la plaque Daguerre," 68.
29. Bann, *Distinguished Images*.
30. Lerebours, "Avis de l'éditeur."
31. Henisch and Henisch, *The Painted Photograph.*
32. Brown, "The World's First Daguerreotype Images."
33. Joly de Lotbinière, "Vue des Propylées"; Joly de Lotbinière, *Voyage en Orient*, 336–38.
34. Marien, *Photography* (1st ed.), 51; Joly de Lotbinière, *Voyage en Orient*, 309–10.
35. In his foreword, the editor only points sweepingly to the participation of Horace Vernet and Frédéric Auguste Antoine Goupil-Fesquet in the views from the Orient.
36. Lerebours, *Excursions daguerriennes*, vol. 2, 1.
37. Lerebours, "Avis de l'éditeur."
38. Plumpe, *Der tote Blick*, 177–94; Dinius, *The Camera and the Press*, 29–32.
39. Lerebours, "Avis de l'éditeur."
40. Gidal, "Lerebours' *Excursions daguerriennes*."
41. Ackerman, "Drawing the Daguerreotype."
42. Marien, *Photography*, 57–66.
43. Challamel, *Vue prise en Normandie*.
44. Buerger, *French Daguerreotypes*, 33–37; Roubert, *L'image sans qualités*, 88–89.
45. Siegel, "Daguerreotypie auf Papier."
46. Siegel, *First Exposures*, 351–353.
47. Gernsheim and Gernsheim, *L. J. M. Daguerre*, 110–11; Hamber, *"A Higher Branch of Art,"* 56–61; Barger and White, *The Daguerreotype*, 42–43; Bonetti, "Daguerreian Pictures."
48. Cornu, "Notice sur l'œuvre scientifique de H. Fizeau," C3–C5; Bajac, "Fizeau, Louis Armand Hippolyte."
49. *Comptes rendus*, 401–2 and 957.
50. Lerebours, "Avis aux souscripteurs, " in *Excursions daguerriennes*, vol. 1.
51. Lerebours, *Traité de photographie*, 125–59.
52. Challamel, "Un des bas-reliefs de Notre-Dame de Paris."
53. "Forgotten Pioneers."
54. Ackerman, "Drawing the Daguerreotype," 55.
55. Elkins, *What Photography Is*; Siegel, "Was Fotografie ist"; Squiers, *What Is a Photograph?*

{ 9. }

Photographs in Text

The Reproduction of Photographs in Nineteenth-Century Scientific Communication

GEOFFREY BELKNAP

What is the value of a photographic image when it becomes part of printed media? Over the last decade, historians of photography have been evaluating photography for its material aspects—how it operates as a document, an object, a tangible image-bearing device that does not just represent but carries information.[1] Photographs are media, as this volume demonstrates. But what happens when these complex aspects of a photograph's ability to capture, represent, carry, and modify information are investigated within the context of what are typically considered primarily textual modes of communication: the periodical, book, and letter.

This chapter investigates the value of the photographic image when placed in the context of textual communication. Periodicals, books, and letters each carry information (both visual and textual) in distinctly separate ways—while the letter is a reactive endeavor that either elicits or responds to a query from a single individual, the periodical and the book are communally constructed items, which go through a process of collection, organization, editing, printing, and publication. The periodical and the book are also distinct from each other in terms of their temporality—while periodicals offer daily, weekly, or monthly news and are not made to be kept, books are bound to time in a much less concrete way and are produced for preservation. When we think about the differences between these three different sites of communication, the questions that arise are, How was it created, over what time was it published, and who was the intended audience? For a letter, this will be a one-to-one relationship, where the how,

what, and who are circumscribed by personal relationships formed and developed on paper. For the periodical, the production of this form of media will have multiple authors vying for space, through the control of the editor, and trying to reach a widely varied audience. In contrast, the book is typically an individual undertaking, where the relationship between the author and the reader is much more straightforward.

Evaluating the meaning of a text, or series of texts, within these varied contexts makes for a complicated reading. It becomes even more complicated when you add images to this reading. Understanding how photographs gain or lose meaning when they move across these various sites of reproduction is the focus of this chapter—under the particular rubric of scientific communication. Photographs, traced across these three media sites, as this chapter will show, are not singular, static objects. Rather, their meanings and values are embedded in their movement across media forms.

The period that this chapter will focus on is tightly focused on the 1870s for two reasons. First, this is the decade that witnessed the formation of some of the most influential illustrated periodicals, such as the *Graphic* and *Nature*. This was a period before photographic images could be reproduced cost-effectively without the aid of an engraver. Second, it is also the period during which photography was undergoing considerable change with the development of the Woodbury printing process (1864), the development of gelatine dry prints (1868), and the invention of "instantaneous photographs" (1872). The 1870s, much more than the 1880s, were a period of change and transition for both printing and visual technologies. Photography and illustrated media, in this way, grew up together and reached an unprecedented point of technological development in the 1870s.

To explicate the value of the photograph across media forms, this chapter examines three case studies of photographs that were made valuable through their publication in textual communication. Beginning with astronomical photography and moving to microphotography and portraiture, the photographic image here becomes less a visual object and much more an epistemological one, which moves and makes meaning as it travels through various sites of communication. While each section will use a single case study to evaluate the role of the photograph within a particular communication form, the scientific periodical acted as a bridge for either the letter or the book to gain wider audiences. One periodical in particular—*Nature*, which was established in 1869 as the mouthpiece of the established scientific community—published the content of books and letters as an essential aspect of their publication.[2] *Nature* will therefore act as the central locus through which photographs can be seen to move from the letter to the periodical to the book and back again.

Photography and the Victorian Periodical

Early in 1871, a photographer named Alfred Brothers published a two-page article in *Nature* detailing a solar eclipse and the application of solar photography to the

observation of that eclipse. Two weeks later, he wrote a follow-up article focusing on eclipse observations but with the result of bringing into question the value and veracity of the engraved photograph itself.[3] The central claim of these articles was that the prominences visible around the sun during an eclipse were products of the sun's corona, not (as was hotly contested) from chromatic distortion by the earth's atmosphere. Brothers justified his claim by reproducing a photograph he had made during a solar eclipse.

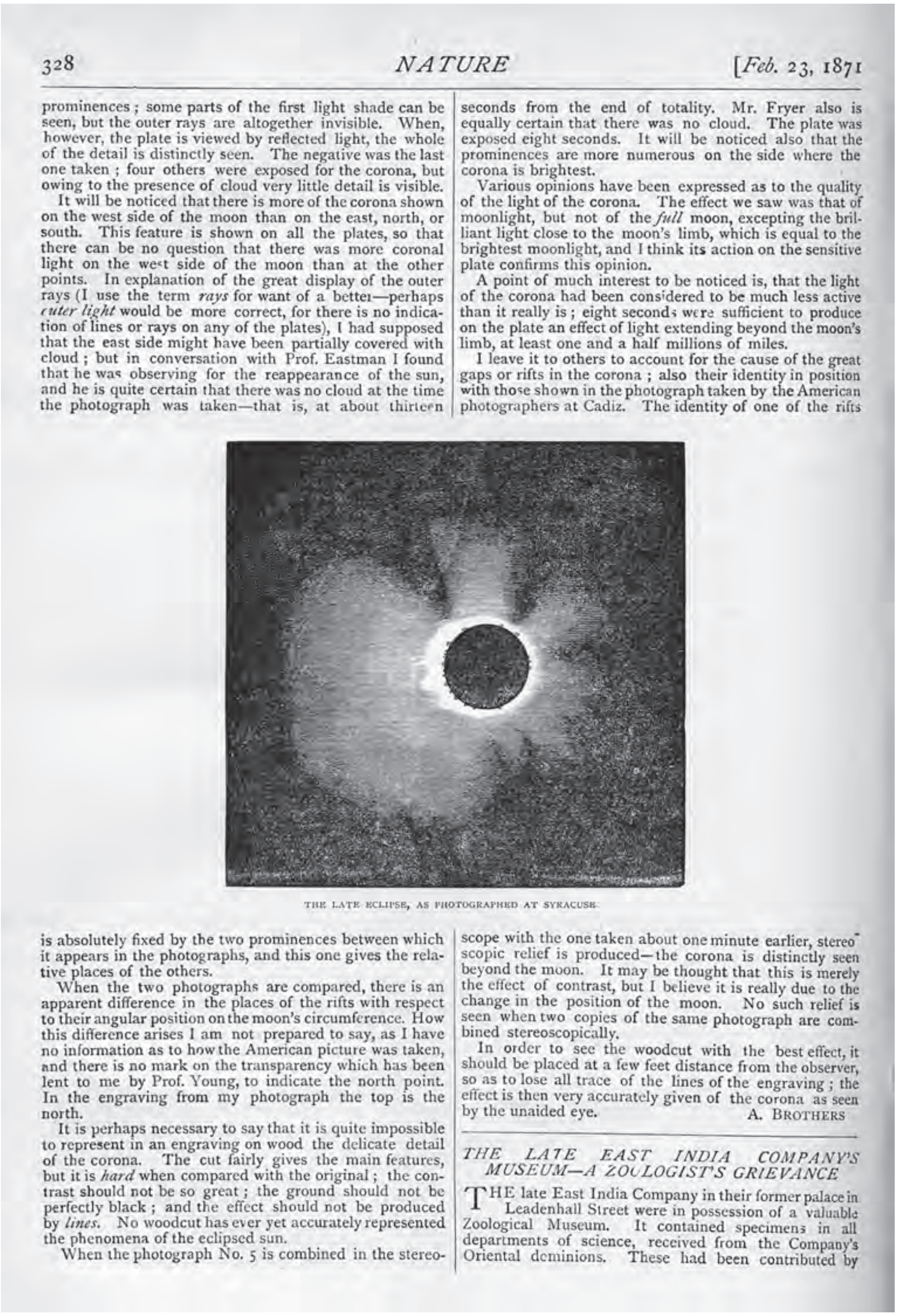
In these articles, Brothers articulated the importance of photography to the collection of scientific data. He achieved this by tracing the chain of translation in the reproduction of his images—in other words, by allowing the reader to follow the process of reproduction and interpretation from the object on the page to the site of its production.[4]

Bruno Latour's notion of the chain of translation is essential here to understand how a photograph was valued for *Nature*. The photograph, unlike any other type of image in the periodical, needed to be authenticated. Unlike hand-drawn images, a photograph offered a degree of verisimilitude, or authenticity.[5] The production of photographic authenticity within *Nature* rested on an inculcation of both what photographic science could be defined by and how this operated in both textual and social spaces. This authority was then utilized to reinforce the visual currency of the images presented within the pages of the periodical. *Nature* reinforced the credibility of its images by tracing a chain of translation through the points of reproduction, back to the photographic referent. For Brothers, the image was not what you saw on the page but how it was placed, how it was reproduced, and how it was described.

Brothers was a fellow of the Royal Astronomical Society (RAS), and yet, even with this valuable scientific credential, he played a peripheral part in the astronomical scientific community. He was largely a commercial photographer, operating a photographic studio in the center of Manchester.[6] While Brothers did produce a photographic history and manual later in his life (1892), during the 1870s, his main claim to scientific authority was his inclusion in the 1870 eclipse expedition to Syracuse.[7]

In Brothers's first article in *Nature*, the primary focus is the half-page wood engraving with the caption "The Late Eclipse, as Photographed at Syracuse" (fig. 9.1). Upon investigating the text, the reader finds that the eclipse that Brothers is both describing and visualizing is that of December 22, 1870. This article and image demonstrate the type of content that *Nature* was communicating to its readership: not immediate news but rather important scientific events of the recent past separated from the immediacy of the moment that was so much a part of the daily and weekly popular periodical press.

For Brothers, the value of his article on the recent solar eclipse came not only in the discovery that he made—the red prominences of the sun, visible only during an eclipse and demonstrating its coronal atmosphere—but also the medium through which he captured this scientific event. The first paragraph of his article demonstrates the authority of this image: "The accompanying woodcut is a copy of a drawing made



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prominences; some parts of the first light shade can be seen, but the outer rays are altogether invisible. When, however, the plate is viewed by reflected light, the whole of the detail is distinctly seen. The negative was the last one taken; four others were exposed for the corona, but owing to the presence of cloud very little detail is visible.

It will be noticed that there is more of the corona shown on the west side of the moon than on the east, north, or south. This feature is shown on all the plates, so that there can be no question that there was more coronal light on the west side of the moon than at the other points. In explanation of the great display of the outer rays (I use the term *rays* for want of a better—perhaps *outer light* would be more correct, for there is no indication of lines or rays on any of the plates), I had supposed that the east side might have been partially covered with cloud; but in conversation with Prof. Eastman I found that he was observing for the reappearance of the sun, and he is quite certain that there was no cloud at the time the photograph was taken—that is, at about thirteen seconds from the end of totality. Mr. Fryer also is equally certain that there was no cloud. The plate was exposed eight seconds. It will be noticed also that the prominences are more numerous on the side where the corona is brightest.

Various opinions have been expressed as to the quality of the light of the corona. The effect we saw was that of moonlight, but not of the *full* moon, excepting the brilliant light close to the moon's limb, which is equal to the brightest moonlight, and I think its action on the sensitive plate confirms this opinion.

A point of much interest to be noticed is, that the light of the corona had been considered to be much less active than it really is; eight seconds were sufficient to produce on the plate an effect of light extending beyond the moon's limb, at least one and a half millions of miles.

I leave it to others to account for the cause of the great gaps or rifts in the corona; also their identity in position with those shown in the photograph taken by the American photographers at Cadiz. The identity of one of the rifts

THE LATE ECLIPSE, AS PHOTOGRAPHED AT SYRACUSE.

is absolutely fixed by the two prominences between which it appears in the photographs, and this one gives the relative places of the others.

When the two photographs are compared, there is an apparent difference in the places of the rifts with respect to their angular position on the moon's circumference. How this difference arises I am not prepared to say, as I have no information as to how the American picture was taken, and there is no mark on the transparency which has been lent to me by Prof. Young, to indicate the north point. In the engraving from my photograph the top is the north.

It is perhaps necessary to say that it is quite impossible to represent in an engraving on wood the delicate detail of the corona. The cut fairly gives the main features, but it is *hard* when compared with the original; the contrast should not be so great; the ground should not be perfectly black; and the effect should not be produced by *lines*. No woodcut has ever yet accurately represented the phenomena of the eclipsed sun.

When the photograph No. 5 is combined in the stereoscope with the one taken about one minute earlier, stereoscopic relief is produced—the corona is distinctly seen beyond the moon. It may be thought that this is merely the effect of contrast, but I believe it is really due to the change in the position of the moon. No such relief is seen when two copies of the same photograph are combined stereoscopically.

In order to see the woodcut with the best effect, it should be placed at a few feet distance from the observer, so as to lose all trace of the lines of the engraving; the effect is then very accurately given of the corona as seen by the unaided eye.

A. BROTHERS

THE LATE EAST INDIA COMPANY'S MUSEUM—A ZOOLOGIST'S GRIEVANCE

THE late East India Company in their former palace in Leadenhall Street were in possession of a valuable Zoological Museum. It contained specimens in all departments of science, received from the Company's Oriental dominions. These had been contributed by

9.1 "The Late Eclipse, as Photographed at Syracuse." From Alfred Brothers, "The Eclipse Photographs," *Nature* 3, no. 69 (1871): 328.

from negative No. 5."[8] This sentence indicates to the reader that even though this image had gone through various modes of reproduction, it was the *original* mode of production that mattered. Brothers points out to his reader that while the image is a woodcut that has been "copied" from a drawing, it is—more importantly—based on an *original* negative. For *Nature* it was essential that the image had moved from an original to a reproduction—and that this mobility could be traced.

Brothers then went on to point out the inadequacies of the wood engraving for expressing what was seen and what was actually captured on film during the passing of the solar eclipse. "It is perhaps necessary to say that it is quite impossible to represent in an engraving on wood the delicate detail of the corona. The cut fairly gives the main features, but it is hard when compared with the original." He continues, "No woodcut has ever yet accurately represented the phenomena of the eclipsed sun."[9] With this paragraph, Brothers was both valuing the photograph as a superior medium of image production and communication and simultaneously undermining the value of wood engraving as an effective mode of visualization. Surely if Brothers could have reproduced his original photographic negative, he would have. Hedged in by the costs and limitations of periodical publication in the 1870s, he used the means available to him. Limited to woodblocks, Brothers needed to authenticate his observations, and subsequent images, through an alternative means.

For Brothers, the reading of this image depended on the reader trusting the chain of translation though which this image was reproduced.[10] The first paragraphs in this article lead the reader to follow this image's construction backwards from a wood engraving to a drawing and finally to the photographic negative, catalogued and in the possession of the author. The reading of this image does not necessitate an understanding of the image itself but instead requires the reader to recognize the authority of the image in its connection to the original object, produced and held by the author.

The authority of the photograph as the point of origin in the chain of translation was reinforced in *Nature* when Brothers entered again into the journal two weeks later. His second article was not only a continuation of his original argument but also a rearticulation of the inadequacy of the modes of production. In "Photographs of the Eclipse," Brothers lamented the mistake in the production of "The Late Eclipse, as Photographed at Syracuse" and was allowed to reproduce his photograph surrounded by new text—this time the right way around (fig. 9.2).

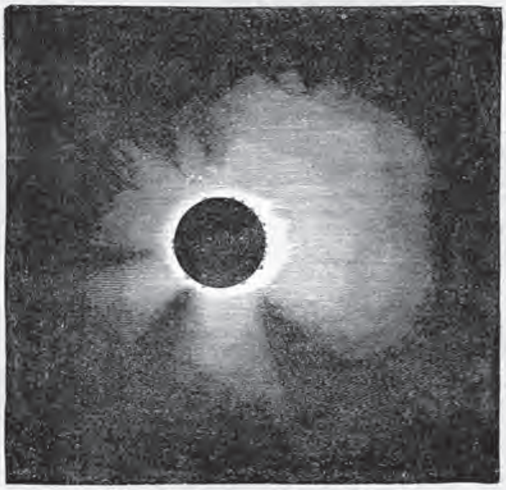
Much as in his first article, Brothers started by apologizing to the readers for the mistake. "Permit me to call to your attention the position of the woodcut illustrating my remarks on the Eclipse Photographs. The south point is where the north should be," he writes. He then finished his paragraph by saying, "As what I have now to say refers to the picture I shall feel obliged if you permit me its reinsertion in its true position."[11] With this Brothers pointed to the image's importance to his argument while at the same time undermining the value of the object on the page. The image needed to be re-presented to the reader because if he had left it unchanged the image

on the Eclipse Expedition. In Mr. Lockyer's article it is stated :—"Now at Syracuse Mr. Brothers also photographed rifts, three rifts, but the sketches did not record a single one ;" forgetting, evidently, that at Syracuse no

From Prof. Watson's Drawing. From American Photo. taken at Cadiz. From Photograph taken at Syracuse.

attempt was made to sketch the Corona either by our own party or the Americans. At Agosta Mr. Brett was stationed, but as the Eclipse was only visible there for about *five seconds*, of course in that time no artist could pretend to make a drawing. It happens, however, that Prof. Watson was at Carlentini, and being favoured with a clear sky he succeeded in making a very careful drawing, which I had the good fortune to see and compare with my photograph No. 5 a few days after the Eclipse. An outline of this drawing I now give, so that it may be compared with the photographs made in Spain and at Syracuse.

There are two or three points which must be considered in comparing drawings and photographs. The photographs will differ according as they are made with a camera or telescope, and the drawings will differ according as they are made with the aid of a telescope or without. With the telescope the field of view is limited, and the eye is naturally attracted chiefly by the intense light of the red prominences and the corona near the moon's limit. Naked-eye drawings ought to be as valuable as photographs, but I doubt if any two artists will ever be found to make sketches agreeing in every particular. On photography must we depend for settling doubtful points of this nature, and it seems to me in this case to be absolutely settled that three rifts are identical. The outline sketches speak



THE LATE ECLIPSE, AS PHOTOGRAPHED AT SYRACUSE

for themselves. A pair of compasses applied to the points formed by lines drawn from the moon's centre to the centres of the depressions (or rifts) in the corona, will show whether or not the places of the three gaps are the same.

It may be said that Lord Lindsay's photographs taken five miles from the station occupied by the American observers in Spain, do not show the rifts. This, I think, must be accounted for by the presence of cloud. The cloud may have been so thin as to be quite invisible in the feeble light of the Eclipse, but yet sufficient to prevent the photographic delineation of the rifts. Three of my photographs were taken through cloud, and they show us traces of rifts. The fifth plate shows three distinctly, and less plainly five or six others.

Professor Watson's drawing shows two gaps corresponding with 1 and 6 in both photographs, and depression in the corona agreeing very closely indeed with my picture.

This evidence seems to me to be absolutely irresistible as to the identity of the great rifts in the corona.

In explanation of the way the outline drawings have been made, I may say that the points marked from 1 to 6 have been pricked through the photographs, Professor Watson's drawing having been reduced to the same scale as the photographs, and pricked off in the same manner.

A. BROTHERS

EXPEDITION OF THE "DUQUESNE"

M. RICHARD, master in the Royal Navy, directed the Expedition, and is now attached to the Lille aëronautic station for the Department of the North. I have interrogated him and elicited from him the following details, which can without inconvenience be placed before the eyes of the general public. The French Republican Government having in view the promotion of general knowledge, as well as the defence of the national integrity, did not object to any communication which is not directly connected with warfare.

The aërostat, "Le Duquesne," was despatched from Paris on January 9, at three o'clock in the morning, before a large attendance, among them some members of the French Institute. The

9.2 "The Late Eclipse, as Photographed at Syracuse." From Alfred Brothers, "Photographs of the Eclipse," *Nature* 3, no. 71 (1871): 370.

could have come under scrutiny for its value and because it was a necessary visual aid for the continuation of his argument.

The emphasis that Brothers placed on photography over drawing was made clear later in the article when he compared the value of eclipse observations made by hand and those made by photographs. "Naked-eye drawings ought to be as valuable as photographs, but I doubt two artists will ever be found to make sketches agreeing in every particular. On photographs must we depend for settling doubtful points of this nature [the solar corona], and it seems to me in this case to be absolutely settled that three rifts are identical."[12] Brothers valued photographs not for their inherent mechanistic worth over drawings, as many drawings were produced during the Syracuse expedition. The photograph's value within this medium lay in the way it dealt with contested sites of observation. While drawings "ought to be" as useful as photographs, the reality was that when it came to questions over the observation of precise details on an image, the photograph was placed above a drawing as a mode for authentic, and verifiable, visualization. The chain of translation thus relied on photography being the point of origin.

Final support for Brothers's claim to scientific authority is found in *Nature's* letters to the editor, where the journal offered space for contested subjects (such as the prominences of the corona) to be debated by the reading community. Letters to the Editor was a regular section in *Nature* that offered the readership direct access to the debates within the journal. It was also, as we will see in the section "From Letters to Print," a space that blurred the lines between two different modes of communication: the letter and the periodical. The Letters to the Editor section offered—like Brothers's invocation to the reader to view his original photograph in order to trust it—a site where a reader could trace an argument back to an author or reader. Between May and June of 1871, Brothers entered into a debate with Mr. D. Winstanley over the validity of his photographs. Winstanley described himself as "an ardent and not inexperienced votary of photography" from Manchester.[13] He does not, however, turn up in the archives of nineteenth-century photographers or scientists, and he was likely an amateur photographer who used the pages of *Nature* to extend a debate about the uses of photography for astronomical science. The public correspondence between Brothers and Winstanley thus represents the struggle for authority between two nonprofessionals in the astronomical community during the last quarter of the nineteenth century.[14]

Their dialogue revolved primarily around the usefulness of photography in advancing astronomical science. In his first letter to *Nature*, Winstanley argued that "I cannot myself look with any very great degree of satisfaction upon the photographs of the late solar eclipse either as examples of photography or as evidence contributing to our knowledge of solar physics."[15] His justification for this was that Brothers's photographs were inconclusive because he had personally observed the sun on a clear, cloudless day when the sun was not eclipsed and at that time had witnessed a solar corona; he concluded that this effect must have been the result of the Earth's

atmospheric moisture.[16] Here Winstanley was using his own personal observation to undermine the evidentiary value of Brother's image.

Brothers's response to this attack on the authenticity of his photographs was to reaffirm the primacy of photography in the chain of translation. Attacking the center of Winstanley's argument, Brothers wrote back, "It would have given me much pleasure to have shown Mr. Winstanley the original negatives of the photographs of the late eclipse of the Sun if he had called on me to see them, and by so doing he would have avoided falling into the mistakes which his letter contains."[17] The wood engravings that adorned Brothers's first two articles were valuable as objects of visual reference. If the images were contested, it was necessary for the critic to trace the chain of translation back to the original mode of production, and at that point the evidence would be visually authenticated. For Brothers, the photographic image was a fundamental technology of visual validation for his theory of the corona of the sun, which he replicated through the chain of translation; for Winstanley, the image, no matter how it was reproduced, didn't matter. In a context where there was a developed and active knowledge community and constant public correspondence, the image presented to the reader did not need to be authentic, just as long as the chain of translation was evident and led back to the photographic image.

From Periodicals to Books

For someone like Brothers to validate his photograph the periodical press was the only print location that was necessary. For other authors, such as the French photographer, aeronaut, and science journalist Gaston Tissandier, the periodical press was a place to foreground a larger visual argument, an argument that would eventually require the space of a book.[18] Yet, for a historian of photography, when thinking about the reproduction of photographs in books, the first thing that comes to mind is the tipped-in photographic book. William Henry Fox Talbot's *Pencil of Nature*,[19] Eadweard Muybridge's *Animal Locomotion*,[20] and the many survey albums made in Britain and the United States[21] are typical examples of the photographic book, which was usually sold by subscription. They are objects that act as a medium to organize, discourse on, and hold photographs for later perusal. The photograph *in* the Victorian book, however, tells a very different story, one about translation and mobility between media sites. Until the commercial application of photogravure and halftone printing in the 1890s, the majority of photographs reproduced in British books were, as in the periodicals, engraved images made from photographs. Moreover, many images that ended up in books were first produced for and read within the periodical press. The engraved photograph, in this analysis, is not a static one but one that moves between different media outlets, taking on new meanings.

This section will examine one set of images, which are both photographic and *about* photography, reproduced first in a periodical before being published in book

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new act of partnership, at length discovered (accidentally, according to the present account) the action of light upon a film of silver iodide. "Photography was henceforth a fact"—unfortunately, however, at this time his partner died, and Daguerre was left to continue his work alone.

The history and progress of the new art of Daguerreotype is then traced, its purchase by the Government described, and the discovery of accelerating and fixing agents gone into. The editor at this stage reminds us that the use of sodium hyposulphite was first made known by Sir John Herschel, but Mr. Thomson erroneously terms this salt a "developing agent." We next arrive at that period of the history when the improvement in lenses effected by Chevallier enabled the time of exposure necessary for a Daguerreotype plate to be reduced, but even then the sitter had to remain motionless for four or five minutes in full sunshine! The torments of the unfortunate patient undergoing this ordeal are very graphically described. The name of Fox Talbot, who had succeeded in fixing the photographic image on paper some years before Daguerre's discovery was made known, does not appear till rather late in this history,

Fig. 1.—Facsimile of a microscopic despatch used during the siege of Paris.

and then in a position which we cannot but consider as too subordinate, to which effect the editor has added a note.

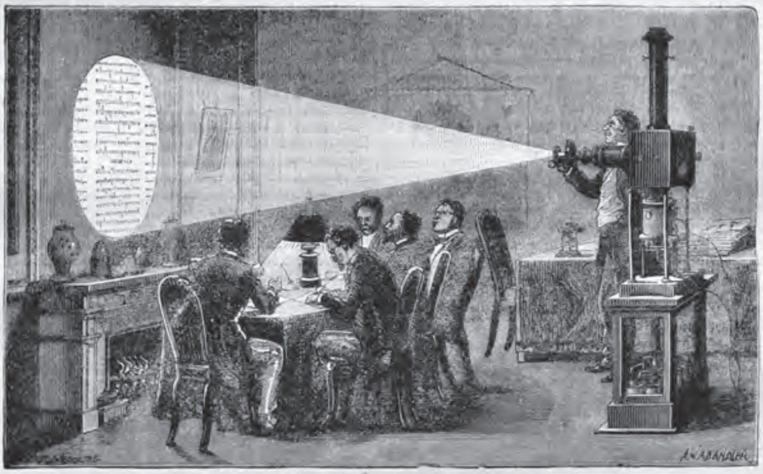


Fig. 2.—Enlarging microscopic despatches during the siege of Paris.

9.3 (*top*) "Facsimile of a Microscopic Despatch Used During the Siege of Paris"; (*bottom*) "Enlarging Microscopic Despatches During the Siege of Paris." From Raphael Meldola, "A History and Handbook of Photography," *Nature* 13, no. 324 (1876): 205.

form (figs. 9.3 and 9.4). In 1874, Tissandier wrote a book entitled *Les merveilles de la photographie* detailing all of the advances in photography up to that date.[22] The book was announced in 1873 in the French periodical *La Nature* in 1873, which first reproduced the images seen in figure 9.3. Two years later, Tissandier's work would enter the British market in the form of two translations, first as a review in *Nature* and then as a complete book, published under the title *A History and Handbook of Photography*.[23]

The book, which summarizes the development of photographic technologies over the nineteenth century, includes a chapter detailing the use of microphotographs during the 1871 Franco-Prussian War. The chapter describes how, with the co-operation of

9.4 "Enlarging Microscopical Despatches During the Siege of Paris." From Gaston Tissandier, *A History and Handbook of Photography* (London: Sampson Low, Marston, Low, and Searle, 1876), 240–41.

three communications technologies—the microphotograph, the carrier pigeon, and the hot-air balloon—information about the siege of Paris could be moved over enemy lines and then read with the aid of an enlarging lantern. War was big news for the scientific press—beyond its political significance, its real importance lay in the science and technology that surrounded it. The value of the war for these two forms of print—the book and the periodical—was encapsulated in the visual and textual narrative made by Tissandier as it moved from periodical to book and back again.

The two woodcuts in figure 9.3 hold different values of reproduction. The image at the top, a reproduction of a photomicrograph, was originally produced in 1873 for the scientific periodical edited by Tissandier, *La Nature*, a year before its publication in *Les merveilles de la photographie*.[24] The image of the photomicrograph underwent the most translation and transmission of all of Tissandier's images in the context of his history of photography. However, this image, as well as the subsequent image of the photoelectric microscope reproduced at the bottom of figure 9.3, would likely not have entered the English periodical press if not for the translation of Tissandier's book into English. While this image was intrinsically tied to the periodical press, the context of its reproduction was also tied to the book.

Nature did not discuss Tissandier's use of carrier pigeons, photography, and balloons during the siege until well after the end of the war.[25] Moreover, the discussion

of this technological event was positioned outside the boundaries of current events or news and was instead part of a review of the translation of *Les merveilles de la photographie*. The review, written by Raphael Meldola and entitled "Tissandier's Photography," is a discussion of the use of carrier pigeons, photography, and hot-air balloons that explicates the contents of Tissandier's history of photography.

Of all the images in the book, only these two were reproduced in the review of Tissandier's photography manual, reflecting the original use of these images by *La Nature*. While the article was intended to be an examination of Tissandier's work as a whole, a closer look at these two images illuminates how the visual value of photographic technologies moved from the book to the periodical. The images that *Nature* chose to reproduce were the photomicrograph and the photoelectric microscope (fig. 9.3). Importantly, these images stood out in Tissandier's book as representative examples of the value of photography—of all the images in *Les merveilles de la photographie*, these two most effectively demonstrated the value of photography in action.

If we examine the image of the photoelectric microscope in detail, we can see that the inscriptions of the author and the engraver of the image, located on the bottom corners, are the same. Moreover, the sizes of the images as reproduced on the page are identical, indicating that they most likely came from the same woodblock. In addition to this, the images are given the same subtitles as in the English translation of Tissandier's book. This is particularly important for the microscopic dispatch, as it informs the reader of the veracity of the reproduction. The spatial organization of the visual objects in both *Nature* and *A History and Handbook of Photography* is identical and represents a direct movement of images from one print space to another.

The only difference between the use of the images in the book and the periodical, in this instance, is in the spatial organization of the images. The two images in figure 9.3, when reproduced in *A History and Handbook of Photography*, are separated onto their own pages (fig. 9.4) and used to create a different narrative in which photography is linked to the use of carrier pigeons. In *Nature* the images act together to demonstrate the singular importance of photography in the Franco-Prussian War. While Raphael Meldola in *Nature* does refer to the carrier pigeon in its discussion of Tissandier's work, the visual and textual emphasis is on photography. For example, the description of figure 9.3 points out that "the method of sending micrographic dispatches by carrier pigeon adopted during the siege of Paris will be of interest to our readers. The dispatch having been printed was reduced by photography on to a collodion film, which was then rolled up and enclosed in a quill, which was fastened to the tail of the pigeon. We here reproduce a facsimile of one of these microscopic dispatches."[26]

The emphasis here is on the veracity of the image—the photograph is a central part of the process and a method for visualizing this important event. Meldola then emphasized the connection between the two images when he explained that "to read the dispatch sent in this way the collodion film was unrolled by immersion in weak ammonia water, dried, placed between two glass plates and a magnified image

projected on to a screen by means of a photoelectric microscope."[27] In similar ways to the reproduction of these images in *A History and Handbook of Photography*, these two images reflect the interrelationship between how an image was made and the larger role that it played in communication. However, unlike the same image in Tissandier's book, these images add another dimension—the reflexivity of the genre of periodical publication. Printed in the periodical press, they took on a new meaning that was a constant reflection of their production and their earlier forms of publication. The chain of translation, in this instance, operated between the publication of the images in book and in periodical form. In this way, they were visual objects moving across time and space, which took on new and multivalent meanings.

From Letters to Print

Letter writing is seemingly very different from the publication of printed material. Letters are typically considered one-off, discrete objects with a limited readership. However, examining the correspondence of one of the more prolific letter writers of the nineteenth century—Charles Darwin—reveals a different story. Darwin's letters often reached a much broader audience through their replication in print, and his use of the photographic portrait within this medium helped to establish and reinforce his scientific network.

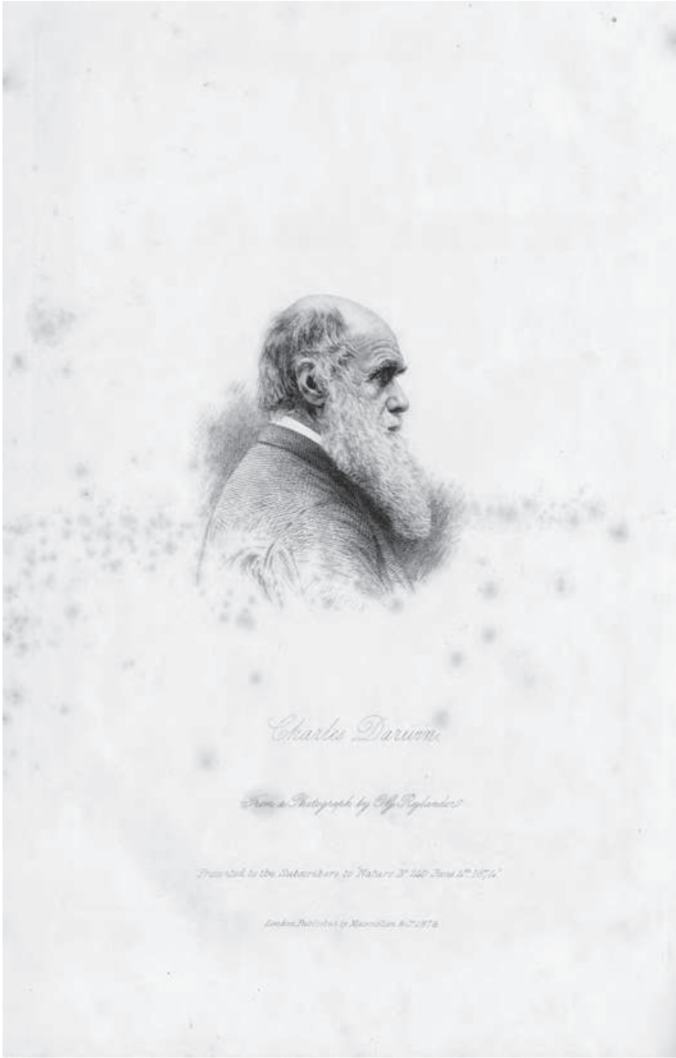
This reinforcement relied in part upon the exchange of photographic portraits.[28] Based on the references within his letters edited by the Darwin Correspondence Project, between 1849 and 1882 Darwin exchanged 132 photographic portraits. The exchange of these photographs, as Defrance and I have shown elsewhere, became an essential way in which Darwin maintained and expanded his scientific network.[29] Exemplified in the case of a photographic album sent by a group of Dutch naturalists on the occasion of Darwin's sixty-eighth birthday, a photographic portrait acted as more than just a keepsake.[30] In response to this generous gift, Darwin wrote, "I suppose that every worker at science occasionally feels depressed, and doubts whether what he has published has been worth the labour which it has cost him; but for the few remaining years of my life, whenever I want cheering, I will look at the portraits of my distinguished co-workers in the field of science, and remember their generous sympathy. When I die the album will be a most precious bequest to my children."[31] The album, which included 217 carte de visite portraits of a whole range of Darwin supporters—from university professors to an actress—was a lavish object, with gilt edges and a velvet cover.[32] The album, as Darwin intimated in his response to Adrian Anthoni Bemmelen and H. T. Veth (the two members of the Dutch Naturalists Society tasked with sending the album to Darwin), was intended as an object of memory and as proof of Darwin's influence in the Netherlands.[33]

And yet, if you were a reader of *Nature*, the album also acted as a piece of news, which circulated first through correspondence and then through the community of

readers of the periodical press. Writing to *Nature* two months after the original album was forwarded to Darwin, Pieter Harding, professor of zoology and comparative anatomy at Utrecht University, forwarded the letter that accompanied the album and Darwin's response to be printed the under the title "Testimonial to Mr. Darwin—Evolution in the Netherlands." Harding included his own letter to accompany this testimonial, stating, "To the album was joined a letter of which, you will find a copy enclosed, with the answer of Mr. Darwin. I suppose you will like to give to both letters a place in your very estimable journal and therefore I have the honour to forward them to you."[34] The reproduction of these letters in *Nature* becomes a substitute for the album. Readers of *Nature* did not need to see the album to understand its value. In other words, the chain of translation between the album and the publication of its contents just needed to be alluded to, rather than given explicit detail. What this photographic album did was reinforce Darwin's importance both in a one-to-one relationship between the senders and the receiver of the album and also within the community that constituted *Nature*'s readership. The photographic portrait, in this instance, was a carrier of scientific valorization. Yet the image did not need to be printed for Darwin's worth to be understood.

Readers of *Nature* were well aware of Darwin's contributions to science, partially due to the publication of his portrait. Three years previously, *Nature* published a portrait of Darwin in an early serial section titled Scientific Worthies (fig 9.5). The engraving was taken from a photograph made by Oscar Rejlander in 1871. Rejlander was a well-known photographer in the late nineteenth century and was the primary photographer for Darwin's *The Expression of the Emotions in Man and Animals* (1872).[35] He was given the right to sell Darwin's portrait publicly through his studio in London, and to any other interested parties—such as newspapers—as a form of payment for his photographic aid on *Expression.* This portrait was also one of Darwin's favorite likenesses. Writing to a publisher in 1871 regarding a request for a portrait to accompany a review of himself and his work, Darwin wrote, "I can have no objection to the portrait & memoir of myself in your Review as proposed. The best photographs of me have been taken by Mr Rejlander, & as it will save you trouble I send you one.—I shd. be obliged for a copy of your Review, if you keep to your intention, as not living in London I may not hear when it is published."[36] Before it ever reached the pages of *Nature*, Darwin's portrait was already circulating within his letter network, through review, and through visitors to Rejlander's studio. When it was finally published in *Nature*, the reproduction of Darwin's likeness would have been relatively mundane.

Darwin's scientific value in *Nature* was ascribed not only in image but through the text. Accompanying the portrait was a description of Darwin's scientific influence written by Asa Gray, the American botanist who was key to promoting and defending Darwin's evolutionary theory in the United States.[37] Darwin was the third scientific worthy whom *Nature* chose to engrave a portrait of, preceded by his advocate T. H. Huxley and the director of the Royal Institution, Michael Faraday. Later subjects



9.5 Charles Darwin, from a photograph by O. J. Rejlander. From Asa Gray, "Scientific Worthies," *Nature* 10, no. 240 (1874): 78–79.

would include Charles Wheatstone, Joseph Dalton Hooker, Hermann von Helmholtz, and Louis Agassiz. These were the luminaries of British, German, and American science in the Victorian period. The publication of portraits in *Nature*, strengthened by a textual description by a scientific authority, reinforced the blurred lines between the letter, the periodical, and the photograph. The value of the photograph in this instance was in its association with the text that surrounded it and the portraits that came before and after. For Darwin and for *Nature*, the photographic album acted as much more than just a keepsake; it was an essential part of the maintenance of his scientific community. The building of this global community was only made possible by the collaboration of these three forms of media—the photograph, letter, and periodical were mutually dependent on each other.

Conclusion

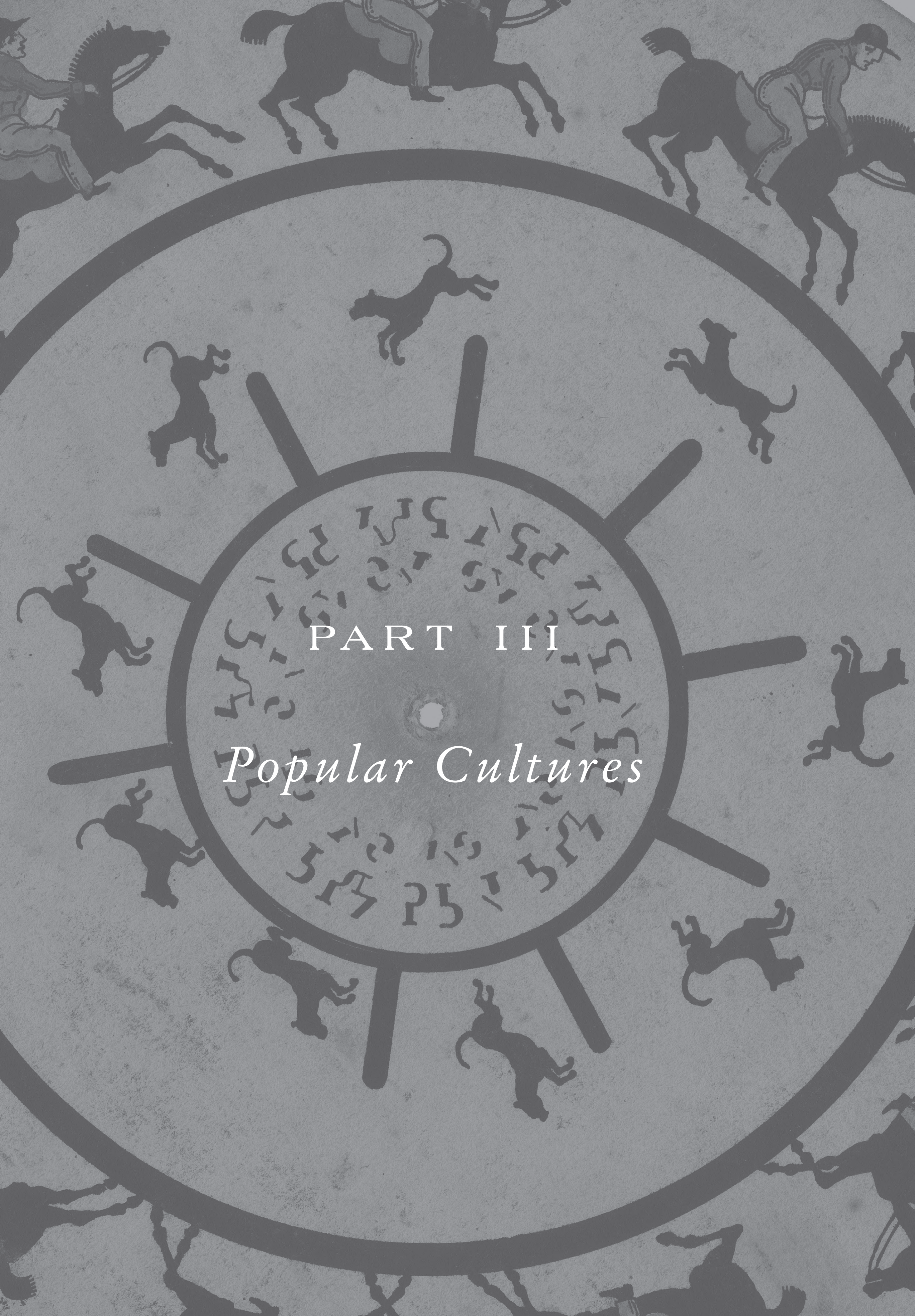
This chapter has used three different examples of the reproduction of the photograph within a site of scientific communication. Brothers, Tissandier, and Darwin have little to do with each other, besides the fact that they were all published in *Nature*. While the first section, on Brothers's photographs, details the values ascribed to the photograph when it remained firmly located within the boundaries of periodical publication, the sections on Tissandier's and Darwin's use of photographs focus on the mutability of the image when it moves across and through various media forms. However, in each of these instances, the photographic image was given value through its ability to be traced back to its origins, through its publication in another media site, or through its association with a scientific worthy. In other words, the value of the image was in its movement rather than its representational capacity. Moreover, what all three case studies have shown is that the various values given to a photographic image—whether as evidentiary proof, explication of an argument, or representation of a scientific figure—were not only made explicit through their reproduction in print but gained meaning as they moved from image to letter to print. It is in their various forms of reproduction, not production, that the photograph in media gains its ultimate meaning.

Notes

1. See Hill, *Getting the Picture*; Beegan, *The Mass Image*; Gervais, "D'après Photographie" and "Either Side"; and Gretton, "The Pragmatics of Page Design."
2. See Barton, "Scientific Authority," and Baldwin, *Making Nature.*
3. See Brothers, "Eclipse Photographs" (February 23, 1871), and "Photographs of the Eclipse," 369–70.
4. Latour, *Pandora's Hope*. Latour argues that the chain of translation is the process through which an experiment gets translated through geographic and textual transportation and reinterpretation, where observational authenticity is only maintained when the steps and processes of translation are textually documented.
5. For a discussion on the relationship between drawing and observing in astronomy, see Nasim, *Observing by Hand*.
6. Ibid.
7. Pang, *Empire and the Sun*, 95, describes the Brothers photographs (which are in the Royal Astronomical Society archives: CAY, box 3, folder 31, "Miscellaneous Folders") as coming from eclipse observations made in Sicily. Norman Lockyer, in an article on the same solar eclipse also gives an account of the Syracuse expedition and how various photographs and drawings were made of the eclipse (Lockyer, "The Mediterranean Eclipse").
8. Brothers, "Eclipse Photographs" (February 23, 1871), 327. This text is dislocated from the image. The first few sentences are placed on the page previous, and the reader would have had to turn the page to see the image to which Brothers was referring. This is a particular example of lack of authorial control in the production of an article—a problem that Brothers also faced in the reproduction of his photograph.
9. Ibid., 328.
10. Moving beyond Latour's original configuration of the chain of translation, in order for the image to fully authenticate Brothers's argument, it was necessary for the chain to lead back to a process of image capture.
11. Brothers ended this sentence with a footnote attributing blame for this mistake to the printers: "This vexing mistake was due to a blunder of the printer in reversing

the block after it had been placed on the machine." Brothers, "Photographs of the Eclipse," 369.

12. Ibid., 370.
13. Winstanley, "Eclipse Photographs," 85.
14. See Pang, *Empire and the Sun*. Also see Tucker, *Nature Exposed*, and Seiberling, *Amateurs*.
15. Winstanley, "Eclipse Photographs," 85.
16. Ibid.
17. Brothers, "Eclipse Photographs" (June 15, 1871), 121.
18. Gaston Tissandier (1843–1899) was a famous balloonist, popularizer of science, photographer, and editor. Having established notoriety during a daring balloon escape over the Prussian military during the siege of Paris in 1870, Tissandier later published texts on photography (Tissandier, *A History and Handbook of Photography*) and acted as the founding editor for the illustrated scientific periodical *La Nature* in 1873. See de Lorenzo, "Tissandier, Gaston," 1393–94.
19. Talbot, *Pencil of Nature*. See the work of Armstrong, *Scenes in a Library*, and Brusius, *William Henry Fox Talbot*.
20. Muybridge, *Animal Locomotion.*
21. See Snyder, *One/Many*.
22. Tissandier, *Merveilles de la photographie*.
23. Tissandier, *History and Handbook of Photography*.
24. Tissandier, "Merveilles de la photographie," 12.
25. In comparison, Tissandier's periodical *La Nature* commented on the carrier pigeon twice in the last two and a half decades of the nineteenth century: in reference to a carrier pigeon used during the siege being found at sea by a German boat ("Un pigeon-voyageur en mer," 287) and in a note on printing on wings of carrier pigeons (Gudefin, "Plumes de Pigeon Voyageur," 246).
26. Meldola, "History and Handbook of Photography," 206.
27. Ibid., 205.
28. For work on Darwin's portrait, see Browne, "Looking at Darwin"; Voss, *Darwin's Pictures*; Prodger, *Darwin's Camera*; and Smith, *Charles Darwin*. For recent work on photography and portraiture, see Brevern, "Resemblance After Photography."
29. Belknap, "Photographs," 147.
30. See the letter that accompanied the album, DCD, http://www.darwinproject.ac.uk/entry-10831 (accessed January 7, 2015).
31. DCD, http://www.darwinproject.ac.uk/entry-10841 (accessed January 7, 2015).
32. The album is held at Down House, Kent.
33. See Di Bello, *Women's Albums*.
34. P. Harting, "Testimonial to Mr. Darwin," 410–11.
35. One of the most famous photographs Rejlander made for *The Expression of the Emotions in Man and Animals* was "Ginx's Baby," which showed a baby crying. This image became reproduced and discussed in many periodicals of the period, including *The Graphic*. Rejlander was therefore well established as the famous photographer of the Ginx baby. For an analysis of this image, see Smith, *Charles Darwin*.
36. DCD, http://www.darwinproject.ac.uk/entry-8003 (accessed January 7, 2015).
37. Gray, "Scientific Worthies," 79–81.



PART III

Popular Cultures

{ 10. }

In the Time of Balzac

The Daguerreotype and the Discovery/Invention of Society

PEPPINO ORTOLEVA

Many people have felt entitled to reprove the author for creating the figure of Vautrin. But it is not too much to insert one convict into a work which has the ambition of daguerreotyping a society where there are fifty thousand convicts.

—Honoré de Balzac, preface to *The Splendors and Miseries of Courtesans*, 1844

In his 1844 preface to *The Splendors and Miseries of Courtesans*, Honoré de Balzac defined his *Comédie Humaine* as "a work which has the ambition of daguerreotyping a society," of producing a series of portraits of men and women belonging to all levels of the social scale, from the aristocracy to the people in jail (like the convict Vautrin).[1] Three years earlier, in his famous *Avant-propos* to the whole series, he had written that his intention was to compete directly with the public registrar—that is, to create a parallel society peopled by so many characters as to give life to a sort of city of the imagination.[2]

If we compare the projects outlined in the two prefaces, we may have the impression of an underlying contradiction: we may think that, on the one hand, Balzac wanted to produce a faithful representation of society while, on the other hand, he

had the ambition of inventing a parallel world. The expression "daguerreotyping a society" may, at first glance, correspond to the idea of faithfully reproducing reality through photography in a mirror-like representation. This interpretation may seem consistent with the meaning attributed by many to the whole of Balzac's oeuvre. If, following the reading of a variety of scholars from Marx and Engels to Caillois, *The Human Comedy* was a "scientific" project, the reference to the daguerreotype can indeed be associated with the mid-nineteenth-century quest to find social truths through "objective" methods and tools.[3] But if, on the contrary, as other interpreters such as Baudelaire pointed out, Balzac was not a scientist but a *visionnaire*, how do we explain the expression he used in the preface to one of his key novels?[4] It was Baudelaire himself, after all, who famously condemned the new medium as trivial and as a "useless and tedious" representation of reality.[5]

Following the thread of contradictions and complexities characterizing Balzac's approach to photography, this chapter looks at the relationship between two important events in media history: the introduction of the daguerreotype and the birth of serialized fiction. As I will show, this endeavor is important for three different but interrelated reasons: first, it sheds light on the fantastic and even supernatural expectations and representations that the daguerreotype inspired and that accompanied and counteracted photography's alleged "objectivity" in the nineteenth century; second, it helps delineate the specificity of the daguerreotype in contrast with later photographic techniques; and finally, it unveils the reasons for the attraction that the daguerreotype exerted on many intellectuals of its time. Building my argument upon Hannah Arendt's definition of society in the modern age as a "curiously hybrid realm where private interests assume public significance,"[6] I argue that the daguerreotype can be interpreted as a sign of the emergence of that very society and as a midpoint between representations of the public and the private realms, and that the daguerreotype and serialized fiction, with their complex interrelations, are both expressions and agents of a wider change in *mentalité* that was accompanied by a change in the representation of the individual and society.

The Daguerreotype, the Stratum, and the Mask

What had Balzac the *visionnaire* to do with the daguerreotype? And more broadly, how can we reconcile his interest in an allegedly reproductive technique with the fact that he was one of the greatest inventors of *fiction* in his age? I will address these questions in this and the following sections, developing my arguments on the assumption that, in order to thoroughly understand the cultural meaning attributed to the daguerreotype at the time when it was a new technology, we must keep in mind that photography became a mass-produced medium only when the negative/positive process entirely replaced the daguerreotype between the late 1850s and early 1860s. First, I will show that Balzac thought of the daguerreotype not simply as a technique generated

from science but also as something rich with supernatural implications. Second, I will demonstrate how the advent of the daguerreotype was perceived by Balzac, as well as by other writers of the time, not only in terms of a faithful reproduction of superficial appearances but also in terms of storytelling and the search for deep truths.

In "My Life as a Photographer" (1854), Félix Nadar described the French writer's peculiar understanding of photography: "According to Balzac's theory, all physical bodies are made up entirely of layers of ghostlike images, an infinite number of leaflike skins laid one on top of the other. Since Balzac believed man was incapable of making something material from an apparition, from something impalpable—that is creating something from nothing—he concluded that every time someone had his photograph taken, one of the spectral layers was removed from the body and transferred to the photograph. Repeated exposures entailed the unavoidable loss of subsequent ghostly layers, that is, the very essence of life."[7]

Although Balzac's semi-magic representation of the daguerreotype has often been interpreted as the result of a personal obsession, its implications went beyond superstition. In Balzac's perspective, Daguerre's invention was not simply able to mechanically *reproduce* living bodies and inanimate things. It had the power of *capturing* them—or at least of taking hold of parts, however thin, of them. The daguerreotype was not a simple bidimensional copy: it was a stratum.

Visionnaire, indeed. This representation of the new technique can help us understand Balzac's idea of "daguerreotyping a society," leading us toward two different directions. One is the possibility that the daguerreotype did not simply reproduce society but was also capable of giving it a sort of autonomous life—the life of a semi-magic slice of reality. A life similar to that of the masks, the personae of the classical theatrical tradition.[8] Let us read a stunning passage at the beginning of *The Girl with the Golden Eyes*:

> Is not Paris a vast field in perpetual turmoil from a storm of interests beneath which are whirled along a crop of human beings, who are, more often than not, reaped by death, only to be born again as pinched as ever, men whose twisted and contorted faces give out at every pore the instinct, the desire, the poisons with which their brains are pregnant; not faces so much as masks; masks of weakness, masks of strength, masks of misery, masks of joy, masks of hypocrisy; all alike worn and stamped with the indelible signs of a panting cupidity?[9]

Not faces so much as masks, says Balzac: those that occupy the scene of a grand theatrical play, the human *comedy* itself. Indeed, if one of the most widely used metaphors to describe the daguerreotype was that of the mirror with a memory, as I will demonstrate in the following pages, the idea that it created or portrayed masks was also supported by some critics and commentators.

It is difficult to determine whether the new technology's supernatural power of capturing a thin stratum of faces and bodies had anything to do with the novelist's

intention to read society in terms of "not faces so much as masks." Perhaps the connection between the stratum and the mask was not so clear to the novelist. But it is worth keeping this connection in mind, because it links the daguerreotype to Balzac's notion of society as a theatrical scene as well as to his idea of the novelist as the one who captures the reality of people by making them act on that scene. If this is true, we can infer that in the mind of Balzac the expression "daguerreotyping a society" had at least as much to do with describing it as it had to do with inventing it, that he conceived the novel more as some sort of experiment with society than as a tool for the faithful and passive reproduction of reality. However, Balzac's representation of the daguerreotype as capable of producing a spectral subreality may lead to a second possible direction: the existence of a sort of machine-made ghost world.

The Sunshine's Insights and the Shadows of Romance: The Daguerreotype as a Mythopoeic Machine

The French writer's fantasies about photography were far from isolated. Alan Trachtenberg has discussed the role of the daguerreotype, and of the craft of the daguerreotypist, in Hawthorne's *The House of the Seven Gables*, published in 1851.[10] Considering the extent to which Trachtenberg's interpretation has attracted the attention of cultural and media historians, it may seem pleonastic to further discuss the role of the daguerreotype within Hawthorne's novel. However, comparing Hawthorne's reception of the photographic medium to Balzac's ideas on the subject may help us notice some meaningful convergences, as well as some divergences. With this aim, let us reread the famous passage in *The House of the Seven Gables* in which the daguerreotypist Holgrave describes the photographic medium: "There is a wonderful insight in Heaven's broad and simple sunshine. While we give it credit only for depicting the merest surface, it actually brings out the secret character with a truth that no painter would ever venture upon, even could he detect it. There is, at least, no flattery in my humble line of art."[11] With these words Holgrave responds to Phoebe Pyncheon, who had expressed her distaste for his "line of art" ("I don't much like pictures of that sort,—they are so hard and stern; besides dodging away from the eye, and trying to escape altogether"). If Phoebe seems to synthesize in few words the criticism expressed by those who wrote about the daguerreotype as a mechanical and inexpressive tool for the production of images, Holgrave's statement is more insightful and original. In his view, far from being superficial, photography reveals deeper truths and goes beyond the eye of the painter, for it goes beyond the power of the human eye itself. The virtue Holgrave attributes to the daguerreotype (and the epilogue to the novel will prove him right) is not that of capturing truth, per se, but that of not being easily deceived by hypocrisy, following the imperative of sincerity and the critique of false social conventions first formulated by Jean-Jacques Rousseau, which later became a crucial aspect of the Romantic ethos.

In reading Hawthorne's lines, Alan Trachtenberg comments that "the analogy of novel writing to photography seems confirmed by the mimetic intentions of both."[12] But things are not so simple. In his preface, Hawthorne is concerned to state that *The House of the Seven Gables* is not a novel but a romance. The novel "is presumed to aim at a very minute fidelity, not merely to the possible, but to the probable and ordinary course of man's experience." The romance, on the other hand, "while it sins unpardonably so far as it may swerve aside from the truth of the human heart—has fairly a right to present that truth under circumstances, to a great extent, of the writer's own choosing or creation. If he think fit, also, he may so manage his atmospherical medium as to bring out or mellow the lights and deepen and enrich the shadows of the picture."[13] According to Hawthorne, the only truth that counts is subjective, and the descriptive power intrinsic to the "wonderful insight in Heaven's broad and simple sunshine" may be nuanced and partially changed by the writer's choice.

In both Balzac's and Hawthorne's work, the relationship between daguerreotype and fiction is far from reducible to concepts like realism and mimesis. In the case of Hawthorne in particular, it is noteworthy that the first important work of fiction in which a photographer figures among the protagonists is classified by its author as pertaining not so much to the realistic pattern of the novel as to the "atmospherical medium" of the romance—where the only fidelity that counts is not the appearance of things but the "human heart." This apparent contradiction, however, reminds us that, when discussing the daguerreotype, we need to take into careful consideration the way in which the medium was perceived at the specific time Hawthorne and Balzac wrote about it. If the relationship between the daguerreotype and fiction is analyzed through a historically contextualized perspective, it becomes clear that, despite the differences in the work of Balzac and Hawthorne, they both conceived the daguerreotype not as a descriptive tool but rather as a mythopoeic medium.

The Daguerreotype's Otherness

We can thoroughly understand the cultural meaning attributed to the daguerreotype by its contemporaries only by taking into account that, at the time of its invention, the medium was a *new* technology defined by contemporary commentators in terms of its "otherness" from what preceded it.

In 1932, Bertolt Brecht opened his *The Radio as an Apparatus of Communication* with these words: "In our Society one can invent and perfect discoveries that still have to conquer their market and justify their existence; in other words discoveries that have not been called for. Thus there was a moment when technology was advanced enough to produce the radio and society was not yet advanced enough to accept it."[14]

Leaving aside Brecht's judgments about "advanced" and nonadvanced technology, we can rephrase his words by saying that the radio was an "other" medium—different from what people expected and radically different from what they had thus far seen

or heard. That in its novelty phase the radio was treated, as Brecht adds, as "a substitute for theater, opera, concerts, lectures, café music, local newspapers, and so forth" does not contrast with its otherness. On the contrary, precisely because its newness required a difficult adaptation, the first step people took was to translate it into something they knew well. As a growing literature has demonstrated, the first thing we do with what is totally unfamiliar is to *assimilate* it to something more familiar.[15]

Brecht's interpretation of the radio offers us a very useful tool for thinking about the advent of new media and the processes of adaptation that their emergence implies. But can we apply Brecht's model to the daguerreotype? And can we say that the daguerreotype arrived in a world that was unprepared for it? At first glance, absolutely not. According to one of the earliest—and for a long time most influential—accounts of its history, proposed by Gisèle Freund in *Photography and Society*, the invention of the daguerreotype met a socially widespread demand for the democratization of the portrait.[16] Freund points out that the social expectations tied to this demand were the habitat in which a variety of technological experiments were developed, until photography (in the form of the daguerreotype) was adopted, as the best solution in terms both of the quality of the image and of technical efficiency. Walter Benjamin too, in his even more influential "Short History of Photography," wrote that "many had perceived that the hour for the invention *had come*."[17] According to Freund and Benjamin, the daguerreotype appeared in a society that was demanding something of the sort.

Yet this representation of the daguerreotype as an invention that everyone expected contrasts with the arguments of other mid-nineteenth-century observers. In his 1839 *Rapport* to the Chambre des Députés, François Arago wrote that when a new tool is applied to the study of nature, the expectations of its inventors count for little: "In this field, it is the *unforeseen* that has to acquire a particular relevance."[18] Arago himself emphasized the word "unforeseen," linking the scientific potential of the daguerreotype with what he envisioned as the future unexpected discoveries that would be brought about by the new medium. Writing about the daguerreotype a couple of years after its invention was announced by Arago, Edgar Allan Poe also used the word "unforeseen": "In such discovery, it is the unforeseen upon which we must calculate most largely. It is a theorem almost demonstrated, that the consequences of any new scientific invention will, at the present day exceed, by very much, the wildest expectations of the most imaginative." Furthermore, he described the daguerreotype as "*infinitely* more accurate in its representation than any painting by human hands."[19] Along the same lines, Hawthorne wrote about the medium as capable of actually bringing out "the secret character with a truth that no painter would ever venture upon." For both writers, with the advent of the daguerreotype something totally new had happened. The chemical-mechanical character of photography, far from making it trivial, was part of its novelty and its value. Within this perspective, photography was not simply a painting without a painter—it was a painting that went beyond the powers of any painter.

At the same time, many other early critics of and commentators on the new technique, from Baudelaire to Kierkegaard, insisted on its triviality, on its being an ultimately dehumanizing product of modernity and industrialization. The acrid lines on photography in Kierkegaard's journal are an unequivocal example of this perspective: "With the daguerreotype everyone will be able to have their portrait taken—formerly it was only the prominent—and at the same time everything is being done to make us all look exactly the same, so that we shall only need one portrait."[20]

Exactly because of the daguerreotype's "newness," not only did people have contrasting views about it, but the same commentators expressed both derogatory and celebratory accounts of the medium. For example, in a letter to Thomas Carlyle (1846), Ralph Waldo Emerson wrote, "'Tis certain that the daguerreotype is the truly Republican style of painting. The artist stands aside and lets you paint yourself."[21] The daguerreotype was to him a Republican invention, an interactive one, we would say in contemporary terms (and this in itself is very interesting, because it reminds us how old are some technological utopias associated to the digital age), in any case something much different from the aristocratic, and thus "un-Republican," tradition of the portrait.[22] But in 1841, upon his first encounter with photography, Emerson's impression, as recorded in his journal, was very different:

> Were you ever Daguerreotyped O immortal man? And did you look with all vigor at the lens of the camera or rather by the direction of the operator at the brass peg a little below it to give the picture the full benefit of your expanded & flashing eye? and in your zeal not to blur the image, did you keep every finger in its place with such energy that your hands became clenched as for fight or despair, and in your resolution to keep your face still, did you feel every muscle becoming every moment more rigid. . . . And when, at last you are relieved of your dismal duties, did you find the curtain drawn perfectly, and the coat perfectly, and the hands true, clenched for combat, and the shape of the face and head?—but, unhappily, the total expression escaped from the face and the portrait of a mask instead of a man?[23]

In its first accounts, the daguerreotype was thus described as both a liberation and a prison; as a revolutionary new path to truth and a banal result of the industrial age, devoid of any artisticity; as a mechanical gaze capable of conveying images whose faithfulness to reality could not be achieved by the human eye; and as an inescapably fake image (a mask). The very novelty or "otherness" of the invention can be located in this unceasing debate, not only among different observers but even in the mind of only one of them, as Emerson's ambivalent reception suggests. This takes us to a second otherness, the one that separates the daguerreotype from the calotype, as well as from the photographic techniques that developed later on. The daguerreotype was not simply a technique in the early stage of the history of photography, it was a medium in and of itself—that is, a different form of communication with its own technical and cultural peculiarities.

What exactly made the daguerreotype a medium in and of itself, not just an early stage of photography? Much has been written about this, but here I shall just try a synthesis.[24] A basic difference was intrinsic to the technology itself: the fact that the daguerreotype was a single image and thus lacked the serial element typical of the modern industry. More than by the long exposure times, the daguerreotype's aura was generated by this uniqueness. When, starting from the late 1850s, negative/positive processes conquered the market, overshadowing the daguerreotype, photographs stopped being single "copies" of the world and began a world of copies. This may help us understand why many of the early observers did not conceive of the daguerreotype as a simple tool for reproduction, as a linear and serial mechanism originated from science, but as a way to a deeper understanding of reality connected to the mysterious and occult forces of nature.[25]

Not only was photography, at the time when the daguerreotype was invented, perceived as an unforeseen medium, but the daguerreotype never became part of the daily habits even of the privileged minority that had access to it, let alone the masses. Over its short history, it went through a complex and never completely achieved process of adaptation to social life, made up in part of an assimilation to more familiar forms of communication, in part of trials and attempts to explore new applications and directions.[26] As soon as the negative/positive process took over, starting in the early 1860s, and even more so with the advent of the snapshot in the 1880s, the integration and dissemination of photography within society, as rightly emphasized by Susan Sontag, resulted in its being an often unobserved part of the environment.[27] We may regard post-Kodak photography as part of a world of images that Western societies tended more and more to take for granted. In contrast to this, the mechanical icon of the age of the daguerreotype was a rarity in a world of relatively rare images. In fact, one of the most typical uses of the daguerreotype was that of being worn as a jewel.[28] This was not only due to the daguerreotype's uniqueness and to the intrinsic value of the materials it contained. As a new technology, it was assimilated into something familiar: the old aristocratic and upper bourgeois habit of presenting locks and miniature portraits in jewel form as gifts to loved ones. It is as if the indexical nature of photography was more accentuated in the daguerreotype. The daguerreotype was perceived as a portrait and at the same time as a direct projection of the person: the metaphor of photography as a mirror of reality insisted on exactly the fact that the person had had to be *there* for the daguerreotype to exist. If we think about the daguerreotype in terms of a presence more than a representation, we can also better understand what Benjamin meant when he argued that due to early photography's long exposure times, the sitters "grew as it were into the picture."[29] Taking Benjamin's claim one step further, I argue that, due to the medium's technicalities but also to its conventional social uses, a daguerreotype portrait was conceived not simply as an image depicting the traits of an individual, but as some form of actual *presence* of the person portrayed.

The fact that the daguerreotype was both a mechanical image and a single, not reproducible object, its strongly indexical nature, and the unforeseen novelty it represented all contributed to what I have defined as the medium's *otherness*. The daguerreotype was radically different from whatever form of visual representation had existed before, a factor that contributed to its being perceived as a miracle of technology but also, at least as much, as the vehicle for a quasi-magic power. It was also radically different from the developments in photography that followed it.

The Daguerreotype and the Invention of Society

Because it was a single unreproducible image, the daguerreotype was mostly used for portraiture. This apparently simple fact triggers some issues that deserve more attention. First, what meaning was attributed at the time to the portrait of an individual? Second, what was the daguereotype's role within the emerging media system? By answering these questions, I will also address my query concerning what the expression "daguerreotyping a society" tells us about Balzac, about the daguerreotype at the time of its invention, and about the society the French writer was describing and inventing at the same time.

The passages quoted above bear evidence to the fact that, in the early commentaries on the daguerreotype, a recurring issue was whether or not the medium revealed some deeper truth about the person portrayed. While Hawthorne expressed his trust in the ability of the new technique to "bring out the secret character," Emerson feared that "the total expression escaped from the face," resulting in a "portrait of a mask instead of a man." Kierkegaard's concern was even worse: in his opinion the daguerreotype reflected a depersonalization of the subject taking place in modern society. These reflections revolve around the daguerreotype's relationship with the "personality" of the portrayed individual; in other words, they are centered on the *psychological* fidelity of a portrait. In the mid-nineteenth century, this was a quite new way of thinking. Obviously, the psychological approach to people's personality traits was not introduced by the daguerreotype. As I mentioned above, the idea of a "truth of the human heart," as opposed to the notion of a public hypocrisy, was part of a new vision of personal life that Rousseau (the "Newton of the moral world," as Kant put it) had perhaps recognized and embodied more than any other intellectual of his time.

So far, the daguerreotype has mostly been interpreted as a direct development of the painted or sculpted portrait, as the democratization of an art genre that was until then a privilege of the aristocracy and the upper class (what Kierkegaard defined as the "prominent" people). Yet, until the early nineteenth century, painters and sculptors were not supposed to show the psychological truth of an individual. Rather, they had to fix the sitter's public persona so that social roles and physical traits perfectly

coincided. The idea of revealing an individual's inner truth as opposed to his or her social mask was not part of portrait aesthetics until the Romantic era.[30]

In the age of the daguerreotype, the descriptive power of a technology, akin to the scientific ideal of truth, encountered the new psychological representation of a human truthfulness. However, this search for psychological knowledge was not yet based on the idea of the unconscious as a pathway to the depth of the human spirit.[31] The daguerreotype represents a midpoint between the prepsychological idea of the portrait and the knowledge value that would be later attributed to the snapshot as a technological parallel to the Freudian paradigm of the subconscious, whose truth lies not in the completeness of its representation but, on the contrary, in its *allusion* to what is not there. The daguerreotype, in this sense, transmits the human icon in a moment of passage between two paradigms of the human persona: the earlier one based on clearly visible and identifiable structured public roles, the later one based on the invisible and generally disordered worlds of the inner self, which can only be hinted at through appearances.[32]

There is, moreover, another complementary perspective from which the daguerreotype may be considered a midpoint between two different representations of men, women, and children in society: the opposition *and* continuity between the public and private realms. The first part of the nineteenth century was, in fact, a moment of great social change, particularly in France and the United States. The two countries were both built upon revolutionary experiences and were first experimenting with democratic society as defined in those very years by Tocqueville: a society based on the growing equality of conditions among its members. As mentioned above, Arendt argued that one of the most important features of the modern state is "that curiously hybrid realm where private interests assume public significance that we call 'society.'" The phrase "curiously hybrid" is strategic.[33] Whereas Roland Barthes in *Camera Lucida* claimed that the appearance of photography corresponds to "the explosion of the private into the public, or rather into a new social value, which is the publicity of the private," Arendt described a more complex process, in which public significance and private interests are interdependent and in a sense generate each other.[34]

In the age of the daguerreotype, the private subject found a *public* expression through this new technique and so affirmed his or her being part of society: not the "publicity of the private" but rather the gradual emerging of a hybrid persona—public in presence, private in motivations. The self-representation that the daguerreotype favored was one in which the private figure forged itself into a public model, and in turn, public personalities were privatized through the long and sometimes excruciating exercise described by Emerson—the private made public but also the public made private, in a continuous exchange that lost its balance in the era of the snapshot in favor of an apparently "pure" triumph of the private. Though reflecting opposite perspectives, the human truth dear to Hawthorne and the mask feared by Emerson were both part of a social and cultural scene characterized by a redefinition of public and private spaces.

In a further sense, the daguerreotype also represented a point of passage, tied to a wider transformation of mentality: the emergence of the idea of society as the self-representation of the collectivity of people and their interactions, distinguished from, and complementary to, the body politic, which was the base of the state. At the time of the daguerreotype, the representation of society as a visible plurality moved by invisible forces (anticipated by Adams Smith's "invisible hand" and later appropriated by positivistic sociology and by Marx's opposition between structure and superstructure) had not yet become part of the common sense even of the cultivated classes. It was more easily read as a sum of people, of faces and masks, as in the description above from Balzac's *The Girl with the Golden Eyes*. The daguerreotype could preserve these faces and masks, mediating not society's invisible structures but its all-too-visible appearances.

Elsewhere, I have proposed that between the early nineteenth and late twentieth centuries, the history of media was punctuated by a series of "systemic turns" during which a variety of forms of communication (as well as transportation) simultaneously underwent a great change.[35] The daguerreotype was part of the first of these turns, which took place between the 1830s and 1840s. This period of explosive innovation was marked by great changes in personal communication, with the introduction of the telegraph and the rationalization of mail service based on the use of postage stamps. Also, the delivery of news was transformed by the birth of press agencies and the development of modern newspapers. Furthermore, as a result of the more general innovations that occurred within the press system, fiction saw the birth of the *feuilleton* in France and of the serialized novel in the United Kingdom and the United States.[36]

Was the invention of the daguerreotype connected with these innovations? In *Understanding Media*, McLuhan insisted on the possible relations between telegraphy and photography, pointing to Samuel Morse's famous report on his visit to Daguerre.[37] On his side, while claiming that the notion of objectivity in American journalism did not appear before the end of the nineteenth century, Michael Schudson connected the emergence of modern journalism in the 1830s with cultural and technological changes in the representation of society. The development of early forms of photography is one of these changes. This takes us back to the point where I started, to that other new communication form of the time: serialized fiction.[38]

It was in the context of this network of interconnected innovations that Balzac developed his great project, probably one of the most ambitious in the whole history of literature: "I attach to common, daily facts, hidden or patent to the eye, to the acts of individual lives, and to their causes and principles, the importance which historians have hitherto ascribed to the events of public national life. . . . It was no small task to depict the two or three thousand conspicuous types of a period; for this is, in fact, the number presented to us by each generation, and which *The Human Comedy* will require. This crowd of actors, of characters, this multitude of lives, needed a setting—if I may be pardoned the expression, a gallery."[39]

By referring to a gallery, Balzac illustrated his goal of creating a portrait of society as a superindividual reality that was not reducible to an invisible system transcending

individuals but was made, instead, of an infinity of persons from all walks of life—and even more than that, of the variety of possible relations among them, from love to money, the most abstract and at the same time "material" of all interhuman media. Such a portrait of society found a humbler but deeply rooted correspondence in the everyday storytelling of the newspapers. By characterizing in this way his aims as a novelist, Balzac went far beyond the dilemma between the realistic and the *visionnaire* approach: his work had to do with inventing the social system in the act of discovering it.

While Nadar was using the daguerreotype to portray the French society of his time in terms of a "pantheon" of its most notable figures, Balzac assumed as his main tool not a machine that he mistrusted (even though he was very much attracted by it). He employed, instead, the tool of fiction. He created not a pantheon but a living city and its surrounding territories and at the same time painted them. In his work, for a moment, fiction and research were not in opposition: they were essential to each other and part of the same project.

Balzac's words in the preface to *The Spendors and Miseries of Courtesans*—"a work which has the ambition of daguerreotyping a society"—were therefore very consciously and aptly chosen. In his time, the daguerreotype was, among many other things, the most suitable metaphor for the dream of producing a representation of the world in which the daguerreotype's infinite accuracy would be combined with the sheer power of imagination. This encounter between science and imagination was expected to result in a thorough understanding of society, at a level of discernment previously unheard of.

Notes

1. My translation. This preface was published in the original edition in 1844 but not republished in later editions. It is part of the *dossier* included by G. Gengembre in the edition published by Presses Pocket in 1991. Balzac, *Splendeurs et misères des courtisanes*, 649.
2. Balzac, "Author's Introduction." This text has been republished and translated many times as a preface or appendix to single novels or to the whole *Comédie humaine.* It appears, for instance, at the end of Project Gutenberg's electronic edition of the full text of Balzac's *Human Comedy*.
3. See, for instance, the letter Engels wrote to Margaret Harkness in 1888, available online at https://www.marxists.org/archive/marx/works/1888/letters/88_04_15.htm, as well as Caillois, Preface to Honoré de Balzac, *À Paris!*
4. See Mikaye, "À propos des citations de Balzac par Baudelaire."
5. Baudelaire, "The Modern Public and Photography."
6. Arendt, *The Human Condition*.
7. Nadar, "My Life as a Photographer," 9.
8. The origins of the word "persona" have been long debated, but the consensus now seems to be that it comes from an Etruscan word meaning "mask." See, among others, Elliott, *The Literary Persona*, ix.
9. Balzac, *The Girl with the Golden Eyes*, 5.
10. Trachtenberg, "Seeing Is Believing."
11. See chap. 6, "Maule's Well," in Hawthorne, *The House of the Seven Gables.*
12. Trachtenberg, "Seeing Is Believing," 460.
13. See Hawthorne's preface to *The House of the Seven Gables*.
14. Brecht, "The Radio," 52.
15. On the processes of assimilation of new media and differentiation between old and new media, see Gitelman, *Always Already New*; Chun and Keenan, *New Media, Old Media*; Balbi, "Old and New Media."

16. Freund, *Photography and Society*, 3–68.
17. Benjamin, "A Short History of Photography."
18. Arago, *Rapport*, 44.
19. Poe, "The Daguerreotype."
20. Kierkegaard's journal is quoted in Sontag, *On Photography*, 207. The whole entry in the journal, with the title "Double Levelling, or a Levelling that Cancels Itself," is in Kierkegaard, *Papers and Journals*, 54 XI 1A 118. Kierkegaard's views on the daguerreotype are discussed in depth by Pattison, *Poor Paris!*
21. In *The Letters of Ralph Waldo Emerson*, vol. 3.
22. On the recurring topoi of media history, see Huhtamo, "From Kaleidoscomaniac to Cybernerd."
23. Emerson, *Journal*, October 24, 1841, in *The Journals and Miscellaneous Notebooks*, vol. 8, 115–16. See Radway et al., *American Studies.*
24. See, among others, Trachtenberg, "Mirror in the Marketplace"; Verplanck, "The Business of Daguerreotypy"; Williams, "The Inconstant Daguerreotype."
25. Morus, "Words of Wonder."
26. Verplanck, "The Business of Daguerreotypy."
27. Sontag, *On Photography*.
28. Batchen, *Each Wild Idea*.
29. Benjamin, "A Short History of Photography," 17.
30. The change in the social perception of individuals brought about by Rousseau, and later by Romantic aesthetics, has been discussed by many scholars. See in particular Sennett, *The Fall of Public Man*; Seligman et al., *Ritual and Its Consequences*.
31. It would be totally anachronistic to think of Freud's idea of the subconscious. However, it would be less anachronistic to refer to an earlier idea of the unconscious that, according to Marcel Gauchet, emerged during the second half of the nineteenth century. Nonetheless, this concept is not to be found in the writings I examine in this essay. Gauchet, *L'inconscient cérébral*.
32. On the shifting understanding of the notion of persona from the perspective of celebrity studies, see Inglis, *A Short History of Celebrity*; Braudy, *The Frenzy of Renown*.
33. Arendt, *The Human Condition*, 35.
34. Barthes, *Camera Lucida*, 98. In an interesting work published online by the American Daguerreian Society, Ben Mattison contends that through the daguerreotype "the triumph of the private man . . . pushed its way into the public realm." Mattison, "The Social Construction."
35. Ortoleva, *Mediastoria*.
36. On the significance of the introduction of photography within this broader shift, see, among others, Natale, "Photography and Communication Media"; Dinius, *The Camera and the Press*; Roberts, *Transporting Vision*.
37. "Within a year of Daguerre's discovery, Samuel F. B. Morse was taking photographs of his wife and daughter in New York City. Dots for the eye (photograph) and dots for the ear (telegraph) thus met on top of a skyscraper." McLuhan, *Understanding Media*, 211. See Morse, "The Daguerreotipe."
38. Schudson, *Discovering the News*, 3–11.
39. Balzac, "Author's Introduction."

{ 11.}

Sound Photography

ANTHONY ENNS

As historians frequently point out, the photographic apparatus was originally conceived as a self-recording instrument. For example, Louis Daguerre famously claimed that his invention "gives Nature the ability to reproduce herself."[1] William Henry Fox Talbot also emphasized this idea in a paper on his early photographic experiments: "I made . . . a great number of representations of my house in the country. . . . And this building I believe to be the first that was ever yet known *to have drawn its own picture*."[2] John H. Fitzgibbon similarly described photography as "*nature copying nature, by nature's hand*."[3] Photography was thus conceived as a purely automatic process, and the photographer's apparent lack of agency seemed to distinguish it from all previous methods of image production.

The idea of the photographic apparatus as a self-recording instrument made it an ideal tool for scientific research, as Lorraine Daston and Peter Galison point out: "These devices . . . produced not just more observations, but better observations . . . for their exercise involved neither free will nor self-command. . . . Instead of freedom of will, machines offered freedom from will—from the willful interventions that had come to be seen as the most dangerous aspects of subjectivity."[4] In other words, the automaticity of the camera seemed to preclude the possibility of human intervention and human error. Kelley Wilder similarly notes that photography seemed to fulfill the necessary criteria for scientific observation: "[I]t was mechanical, and so indefatigable. It was indiscriminate, and therefore objective. It was optical, and consequently reliable."[5] Wilder's emphasis on the importance of optics also shows how photography reinforced the "scopic regime" of modern science, which was based on the idea that the natural world "could only be observed from without by the dispassionate eye of the

neutral researcher."[6] The camera was thus seen as an ideal tool for scientific research because it embodied the "dispassionate" and "neutral" gaze of the scientist.

The development of sound-recording technologies was also driven by a desire to create an automatic self-recording instrument, and these technologies were often described as photographic due to their ability to preserve indexical traces of previously ephemeral phenomena. In 1856, for example, French photographer Nadar conceived of an "acoustic daguerreotype" that would allow sounds to record themselves in the same way that the daguerreotype allowed light to record itself.[7] In 1864, he renamed this hypothetical invention the "phonograph," which he described as "a box within which melodies would be fixed and retained the way the camera seizes and fixes images."[8] Unlike Edison's phonograph, however, Nadar's imaginary device recorded images of sounds—an idea inspired by French mathematician Jules Antoine Lissajous, who had visualized sonic vibrations by attaching a mirror to a tuning fork and reflecting light from the mirror onto a screen. Nadar thus envisioned the automatic recording of sound waves in the form of graphs, which would show "harmony . . . to be a science as rigorously exact as geometry!"[9]

In 1857, French stenographer Édouard-Léon Scott patented a scientific instrument called a "phonautograph," which was similarly described as an "apparatus for the self-registering of sound," as it allowed "the musical phrase escaping from the lips of the singer . . . to write itself."[10] Scott also compared this device to a camera, as it allowed scientists "to achieve for sound a result analogous to that attained presently for light by photography."[11] Like Nadar's phonograph, therefore, Scott's phonautograph was not designed to enable the reproduction of sound; rather, it was conceived as a self-recording instrument that converted sounds into signs, which were understood as a visual language produced by the sounds themselves.[12]

In 1877, French poet Charles Cros also conceived of a process that involved tracing sound waves, photoengraving these traces onto metal plates, and then using these plates to reproduce the original sounds. Although Cros never actually built this device (which he also called a "phonograph"), it was publicized by the Abbé Lenoir, a clergyman–science writer, who described the recordings as "voice photographs" that would enable the reproduction of sound: "By this instrument . . . one will obtain photographs of the voice, as one obtains them of features of the face, and these photographs . . . will be used to make people speak, or sing, or declaim, centuries after they shall be no more."[13] Cros's invention thus represented a shift from inscription to reproduction, but it was still understood as photographic because it allowed nature to record itself.

In his 1878 essay "The Phonograph and Its Future," Thomas Alva Edison similarly described phonograph recordings as "voice photographs," which were more valuable than photographic portraits: "For the purpose of preserving the sayings, the voices, and the last words of the dying member of the family—as of great men—the phonograph will unquestionably outrank the photograph."[14] In other words, Edison implied that the phonograph would be more effective at recreating the semblance of life by capturing the flow of time instead of fixing a moment in time.

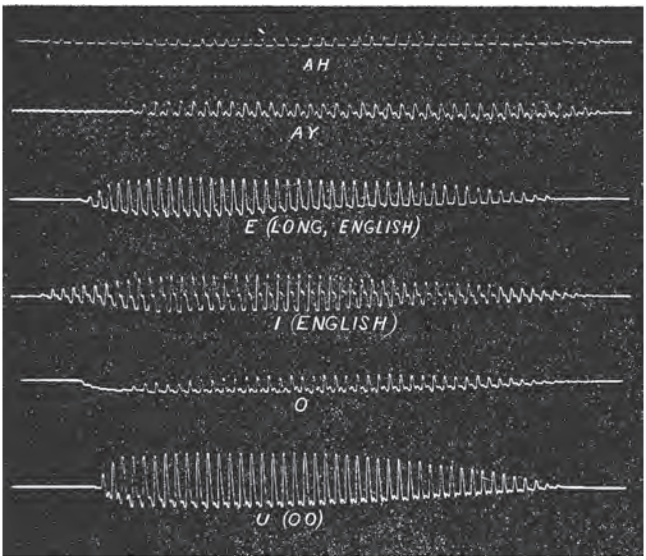
Phonography was thus frequently compared to photography, as it was also conceived as a self-recording instrument that allowed nature to record itself. However, there were significant differences between these technologies, as the immersive quality of sound and the temporal nature of sound recordings seemed to make the phonograph less effective as a scientific instrument. Nadar's phonograph and Scott's phonautograph were more useful for studying acoustic phenomena, for example, because they converted the chaotic, immersive, and time-bound experience of listening into the coherent, detached, and temporally static experience of reading, which allowed observers to analyze the properties of sounds in a more precise and objective way.

As this chapter will show, photography was the main visualization technique used in this context during the late nineteenth and early twentieth centuries. Phonograph recordings may have "outranked" photographic portraits in terms of their ability to reproduce temporal flow, yet the practice of photographing sounds was far more useful for scientists because the photographic apparatus was capable of representing the temporality of acoustic phenomena as a static image, which facilitated the analysis of sonic properties in terms of mathematics. This process also served to reinforce the scopic regime of modern science, which sought to exert mastery over nature through the assertion of an objective and neutral scientific gaze.

Acoustics

The first scientific method of visualizing acoustic phenomena was developed in the late eighteenth century by German scientist Ernst Florens Friedrich Chladni, who spread quartz dust on iron plates and then caused the plates to vibrate by stroking them with the bow of a violin. Depending on the rate of vibration, the dust would settle at certain nodal points, which produced distinct visual patterns. Chladni concluded that specific sounds were associated with specific "sound figures" (*Klangfiguren*), which were generated by the sounds themselves.[15] In other words, Chladni developed not only a method of converting sounds into signs but also a means of allowing sounds to inscribe themselves. As Jonathan Sterne points out, the science of acoustics depended on this technique, as it transformed sound into an "object of knowledge."[16] Chladni's technique was also a necessary precondition for the mathematical analysis of sound, as "sound had . . . to be seen in order to be quantified, measured, and recorded."[17]

English physicist Thomas Young later developed a method of representing sounds in the form of curved lines,[18] and French mathematician Jean Baptiste Joseph, Baron de Fourier, showed how these curves could be analyzed using trigonometry by breaking them down into a series of sine waves that represented the fundamental frequency and the harmonic frequencies.[19] Sir William Thomson (Lord Kelvin) similarly described a method of visualizing sounds by representing changes in air pressure in the form of curves, and he concluded that a "single curve, drawn in the manner of the curve of prices of cotton, describes all that the ear can possibly hear," whether it might be the

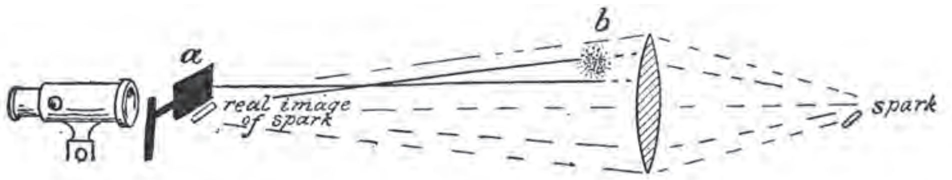


11.1 "Photograph of Vocal Sounds." From E. W. Blake Jr., "A Method of Recording Articulate Vibrations by Means of Photography," *American Journal of Science and Arts* 16 (1878): 57.

"single note of the most delicate sound of a flute" or "the crash of an orchestra."[20] Like Young and Fourier, therefore, Thomson sought to represent sounds as signs that could then be analyzed using mathematics.

The practice of sound photography was based on these earlier experiments, as it similarly sought to represent sounds in the form of curves that could be analyzed mathematically. In 1876, for example, German physicist S. Theodor Stein described a method of photographing sounds by boring a hole through the end of a tuning fork. A beam of light passing through this hole would then strike a photographic plate moving at a uniform speed, thereby producing a permanent record of the waveform.[21] In 1878, American physicist Eli Whitney Blake Jr. developed a similar method of recording sounds by magnifying the minute vibrations of a telephone mouthpiece and preserving a photographic record of these vibrations in the form of a curved line (see fig. 11.1).[22] Blake also noted that these curves could be used to analyze sounds mathematically, as the "abscissas . . . serve to determine the *pitch*" and "the ordinates represent the amplitude."[23]

Following the invention of the phonograph, scientists also attempted to analyze the grooves on phonograph cylinders in the hope that this device would provide a more useful method of converting sounds into signs. In 1878, for example, American scientist Persifor Frazer Jr. placed a phonograph cylinder under a microscope to observe the shapes imprinted on its surface by different vowel sounds.[24] Several scientists also developed methods of photographing phonograph recordings. In 1889, for example, German physiologist Ludimar Hermann employed the phonograph to test theories of vowel production, and he enlarged the grooves of a phonograph cylinder using a mirror mounted on a delicate tracing device. As this device passed over the groove, a beam of light reflected from the mirror fell upon a moving photographic



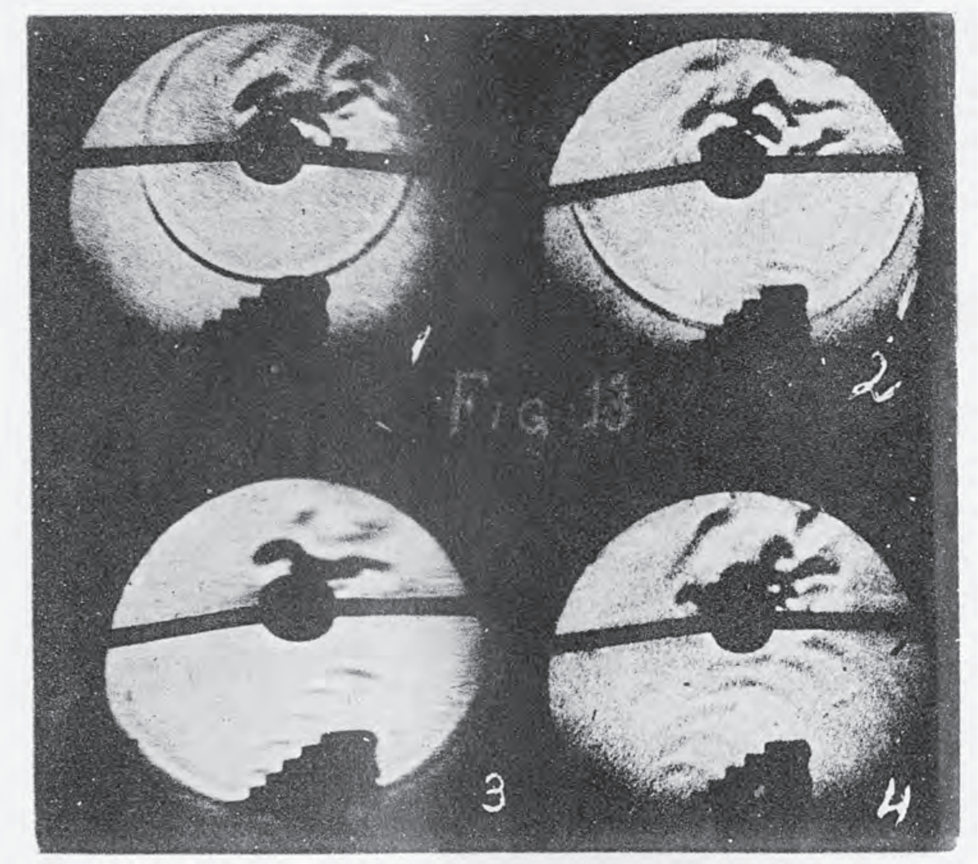
11.2 "Arrangement of the 'Schlieren' Apparatus." From Robert W. Wood, "Photography of Sound-Waves by the 'Schlieren-Methode,'" *Philosophical Magazine and Journal of Science* 48 (1899): 218.

plate, thereby producing a permanent record of the waveform.[25] Frazer and Hermann were more interested in the phonograph's ability to record indexical traces of sounds than in its ability to rephenomenalize these sounds, but photography was clearly needed in order to make these traces legible as signs. As a result, the photographic apparatus was effectively used as a highly sensitive phonautograph.

At the same time that Hermann was attempting to produce photographs of phonograph recordings, American physicist Robert W. Wood was developing another method of photographing sounds using German scientist August Töpler's "Schlieren" apparatus (see fig. 11.2), which was capable of photographing changes in atmospheric pressure caused by sound waves.[26] Due to the small size of these images, it was relatively easy to record a large number of photographs on the same plate by moving the plate rapidly during the exposure. By arranging these photographs in sequence, Wood was able to create chronophotographs depicting the movement of sound waves through space. The practice of "Schlieren" photography thus allowed him to convert acoustic phenomena into visual images, which revealed that the behavior of sound waves was remarkably similar to that of light waves. Wood even recorded the existence of sonic "shadows" cast by the wave front, and he photographed complex musical tones by reflecting sound waves off of small, multitiered shapes resembling steps (see fig. 11.3).

While Wood was primarily concerned with the analysis of spatial acoustics,[27] American physicist Dayton Clarence Miller developed another photographic device called the "phonodeik," which was designed for harmonic analysis. By projecting a beam of light onto a mirror connected to a diaphragm, the phonodeik effectively translated sound waves into light waves that could be recorded on photographic film (see fig. 11.4).[28] In order to assess the tonal elements of a sound, Miller also divided the waveform into its component parts (fundamental and overtones), which were represented as a series of sine curves. There were some significant differences between Töpler's Schlieren apparatus and Miller's phonodeik, as the latter focused on frequency rather than volume, yet they were fundamentally similar in that they both converted sounds into signs that could be analyzed using mathematics.

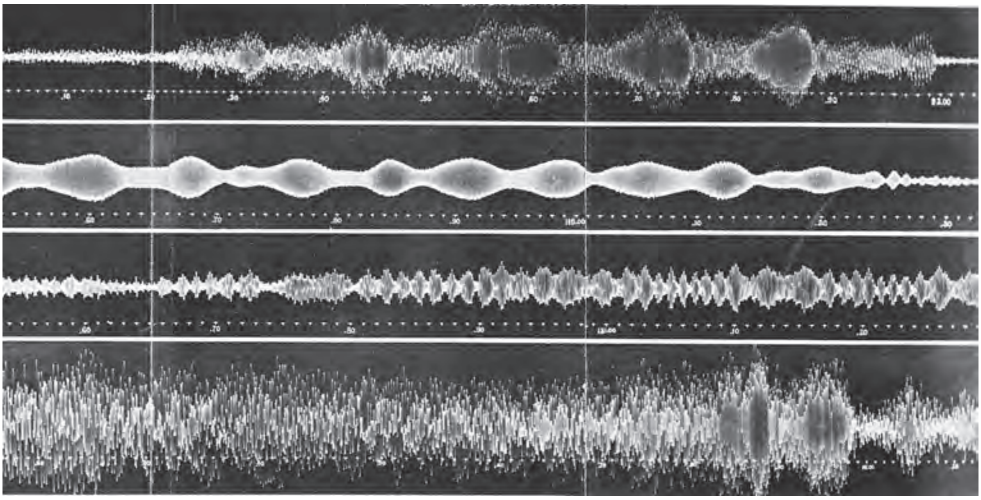
By projecting these waveforms onto a screen, Miller was also able to give public demonstrations of his acoustic experiments.[29] His sound photographs were even featured in a series of advertisements for the Aeolian-Vocalion phonograph, which attributed



11.3 "Photograph of Sounds Made with the 'Schlieren' Apparatus." From Robert W. Wood, "Photography of Sound-Waves by the 'Schlieren-Methode,'" *Philosophical Magazine and Journal of Science* 48 (1899): n.p.

the superior quality of the phonograph to the development of sound photography: "The Aeolian Company has at command the most perfect means known to science for photographing and analyzing 'tone waves.' And it is interesting to know that the tonal perfection of its new phonograph—The Aeolian-Vocalion—is partly due to hundreds of photographs of such tone-waves. These afforded the means for visual comparison and analyses, so that the superiority of the Vocalion's tone is a tangible, demonstrable fact."[30] While Miller intended to use the phonodeik to improve the design of musical instruments, this advertisement indicates that it was also used to improve the design of sound-recording technologies. Sound photography also solved the problem of how to promote sound technologies through the medium of print, as it showed that acoustic fidelity could only be ascertained through "visual comparison" rather than listening.

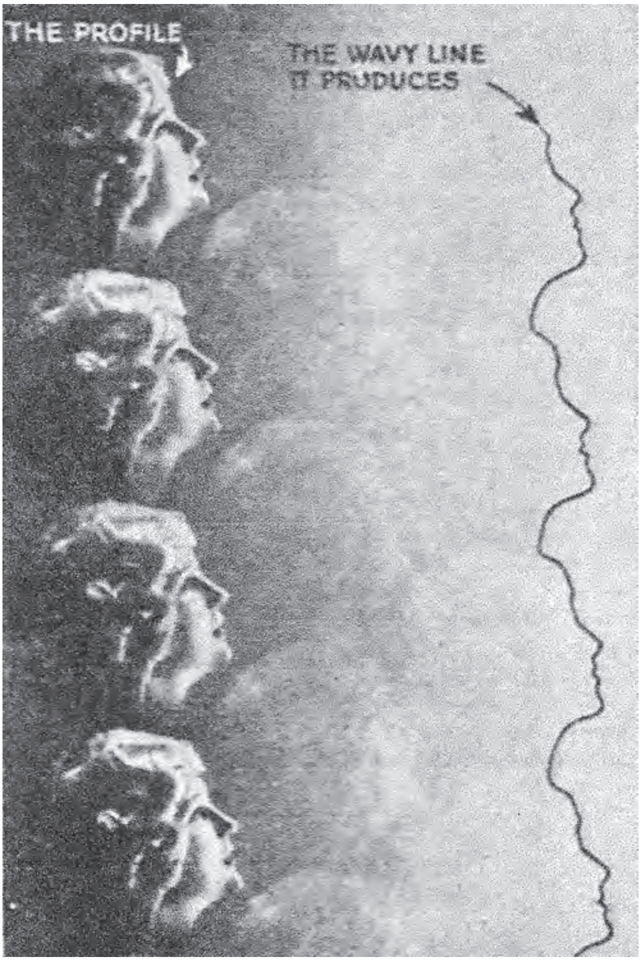
Miller also claimed that sound photography could facilitate the reproduction of sounds by dividing them into their component parts and then synthesizing these elements using organ pipes. A reporter for *Scientific American* claimed that "so exact a



11.4 "Photographs of Sound Waves." From Dayton Clarence Miller, *The Science of Musical Sounds* (New York: Macmillan, 1916), n.p.

reproduction can be made that it is often impossible for a person in an adjoining room to tell whether he is hearing the person's voice or the mechanical reproduction."[31] Miller also argued that the phonodeik revealed a fundamental parallel between visual and acoustic aesthetics, as they both relied on symmetrical forms and soft curves. As a reporter for *Popular Science Monthly* explained, "All musical sounds are represented by composite curves that seem to flow smoothly with rounded bends and symmetrical groupings, creating an effect pleasing to the eye. The discordant musical sounds and noises, on the other hand, are always represented by waves that have kinks, sharp points, and zigzags."[32] Miller reportedly came to this conclusion after analyzing the sound of a French horn, which he believed to be the most beautiful-sounding musical instrument.

Miller was surprised to discover that the curve created by the sound of the French horn closely resembled the profile of a beautiful woman, and he gradually became convinced that a beautiful face represented a visual analogue of a beautiful sound: "This symphony of faces is singing a melody to the eye as sweet as the note of the French horn sounds to the ear."[33] He even applied his method of harmonic analysis to photographic portraits by converting the profiles of human faces into curves that could be repeated periodically to represent musical sounds. According to Miller, this practice was based on the fundamental similarity between the beauty of the human form and the beauty of mathematical equations: "If mentality, beauty, and other characteristics can be considered as represented in a profile portrait, then it may be said that they are also expressed in the equation of the profile."[34] Miller also employed organ pipes to synthesize the sounds represented by these curves. The reporter for *Popular Science Monthly* described one such experiment that employed the portrait of a famous Hollywood actress (see fig. 11.5):



11.5 "Harmonic Analysis of a Portrait Profile." From "Can You Play Your Profile on the Piano?," *Popular Science Monthly* 101, no. 2 (1922): 44.

> A photograph of the actress was placed in a projecting lantern and thrown upon a sheet of paper. The profile was accurately traced. Then, by means of the harmonic analyzer, the profile curve was resolved into its simple component curves. There were found to be seven components. Then seven organ pipes were selected, each of which was known to give a sound with a simple curve corresponding to one of the simple component curves of the profile. All of these pipes were connected with a source of compressed air and sounded simultaneously. The result was a rich harmonious chord, with a sound very like that of the French horn that had suggested the experiment![35]

In other words, Miller conceived of profiles as mathematical graphs that could be phenomenalized as sounds, which implied that it was possible to convert virtually any portrait into a mathematical equation that could be synthesized as music using organ pipes and then converted back into a portrait using the phonodeik. All of these conversions were made possible by photography, as the photographic apparatus provided the means of bridging acoustic and visual phenomena.

As Douglas Kahn points out, Miller's emphasis on the beauty of simple curves avoided any analysis of the "kinks, sharp points, and zigzags" of noise. The scientific practice of harmonic analysis thus represented an early form of noise reduction: "Miller synthesized a woman whose capacity to be calculated and technologically reproduced, whose beauty and harmony would eliminate noise."[36] However, Kahn fails to mention that this process of "bring[ing] noise into line" depended not only on the perceived objectivity of the photographic apparatus and its ability to allow sounds to record themselves but also on its ability to convert sounds into signs, which facilitated the mathematical analysis of waveforms. The beauty of music, like that of the human form and mathematical equations, could only be ascertained through photographic representations.

Ethnomusicology

The study of ethnomusicology also sought to preserve indexical traces of previously ephemeral acoustic phenomena and to analyze these phenomena by breaking them down into their constituent elements. Rather than privileging harmony over noise, however, ethnomusicologists were primarily concerned with the chaotic, irregular, and disruptive elements in ethnic musical traditions, which could not be transcribed using Western forms of musical notation. These musical forms were difficult to transcribe due to the inherent limitations of the ear as well as the cultural bias of the musicologists themselves. As Dutch ethnomusicologist Jaap Kunst (who coined the term "ethnomusicology") explained, "Our organ of hearing . . . has an unconscious inclination to 'correct' tones and intervals that do not fit in with our own familiar tonal system. . . . Without recourse to a measuring instrument it is absolutely impossible to fathom the nature, the structure of an exotic scale."[37] The study of ethnic musical traditions thus presented a challenge to musicologists, as it exposed the subjective nature of listening practices, and ethnomusicologists attempted to meet this challenge by employing new scientific instruments that were seen as more objective, impartial, and accurate than the ear.[38]

One of the primary instruments used by early ethnomusicologists was the phonograph. For example, Austrian ethnomusicologist Erich von Hornbostel argued that the phonograph was an invaluable tool for the study of ethnomusicology because researchers no longer had to rely on subjective memories. It was also possible to manipulate the speed of phonograph recordings, which enabled more accurate analyses.[39] Hungarian composer Béla Bartók similarly argued that the phonograph was an essential tool for collecting folk music due to its accuracy, objectivity, and manipulability.[40] Phonograph recordings were thus considered superior to live performances because of their permanence, precision, and pliability, and some historians even argue that it was not until the development of the phonograph that ethnomusicology itself became possible.[41]

What historians often fail to mention, however, is that early ethnomusicologists also relied on photography, as they sought to convert sounds into signs that would provide more accurate and precise representations of ethnic musical forms. In the early 1920s, for example, Miller photographed several Native American songs that had been recorded by American anthropologist Frances Densmore.[42] When the Smithsonian Institution sent Densmore to American psychologist Carl Seashore to "have her ears certified with reference to the degree of reliability for the transcribing of phonograph records," Seashore conceived of a new method of photographing sounds that would help to overcome the inherent limitations of the ear: "It then occurred to me that it was possible to avoid depending upon the ear, which is quite inadequate for the purpose, and substitute a photographic method. This led to the developing of photographing of phonograph records, and that in turn to the direct photographing from a musician's performance. . . . For the purposes of collecting the camera is vesting superior to the phonograph in that it furnishes a permanent record, giving vastly finer details than can be heard from the phonograph, and is transcribable and measurable with a high degree of precision."[43] According to Seashore, therefore, photography was superior to phonography because it was capable of recording the slightest deviations of pitch, intensity, and time, which made it "far more faithful . . . than even the most musical ear."[44] Seashore also claimed that his new process, which he called "phonophotography," would allow scientists "to define, describe, measure and control such a subtle aspect of the expression of tender emotion as the slightest change in the character of a vibrato."[45]

Phonophotography was specifically designed for the study of ethnomusicology because "the untutored savage" does not approach "his song in terms of conventional concepts of pitch and time"; instead, "he soars through tonal regions with rhythmic movements, sharp syncopation, and liberal frills of adornment."[46] Seashore thus described ethnic musical forms as wild, unruly, and chaotic due to the performers' lack of training and intense emotionality, and he argued that phonophotography provided an ideal method of recording, collecting, and analyzing this music due to its accuracy, impartiality, and visuality. Seashore also claimed that the ultimate goal of this technique was the reconstruction and reproduction of these primal emotional expressions: "It is now only a matter of patient workmanship for the future inventor to make a synthetic human voice automaton capable of . . . playing upon the whole gamut of emotions in vocal expression."[47] Like Miller, therefore, Seashore not only argued that sound photography provided a more precise method of analyzing musical sounds, but he also believed that it could facilitate the reproduction of these sounds.

American psychologist Milton Metfessel, who was also an early ethnomusicologist and a student of Seashore, devised a portable phonophotographic camera built into a suitcase, which similarly produced visual inscriptions of sounds that were recorded on celluloid film.[48] These photographically encoded sound waves could then be measured and analyzed based on frequency, amplitude, and duration. Like Miller, therefore, Metfessel sought to quantify acoustic values using mathematics, and he argued that

phonophotography was superior to traditional musicological methods because it surpassed the limitations of the ear and the subjective nature of listening. In the fall of 1925, the Rockefeller Foundation funded a major research project that involved recording "Negro songs" using phonophotography, and Metfessel was placed in charge of the project. His research was published in the 1928 book *Phonophotography in Folk Music*, which was designed to demonstrate the value of phonophotography in capturing the savage and chaotic nature of African American music—a form of music that was allegedly impossible to record using traditional musicological methods due to the limitations of the ear and the cultural bias of musicologists: "That the ear is inadequate to describe many of the important elements of music is best indicated by the American Negro vocal embellishments, whose description has baffled the keenest ear."[49] Metfessel thus argued that ethnomusicologists needed to overcome the subjectivity of listening through the "objective analysis of the sound waves,"[50] and phonophotography facilitated this analysis "by substituting objective experiments for opinions, and by the utilization of graphic and statistic methods."[51] As a result, it "lifts folk music out of the subjective and intangible into an objective, measurable physical reality," which "will assist in removing the uncertainties and prejudices that have pervaded the study of folk music."[52]

In addition to recording unnotatable music, phonophotography was also designed to reveal the psychological dimensions of folk music: "With the objective facts in hand, we may correlate the vibrato with principles of neural discharge, showing the relation of artistic expression in music to nervous instability in terms of neurological concepts."[53] Like Seashore, therefore, Metfessel used phonophotography to understand how emotions were expressed through music. His photographs of folk songs were also intended to reveal the primitive nature of African Americans: "The personal decorations of primitive man are no more tangible than the ornaments of voice, when the latter are brought out by phonophotography."[54] Sound photographs thus displayed the "ornaments" of African American singing, just as museums displayed the "decorations" of other so-called "primitive" cultures: "The ornaments appealing to the hearing of their fellows may now be displayed in our museums alongside the appeals to sight."[55] In other words, Metfessel's efforts to photograph "Negro songs" were motivated by a desire to put African Americans on display in the same way that African cultures were put on display in ethnographic exhibitions.

Unlike the science of acoustics, therefore, the study of ethnomusicology did not seek to reduce or eliminate noise. On the contrary, it was precisely the noise of ethnic musical forms that ethnomusicologists sought to capture and analyze. These fields remained closely related, however, as the identification, categorization, and classification of these sounds depended on the use of photography. Furthermore, the images generated by phonophotography were designed to emphasize and exaggerate the perceived differences between Western and non-Western musical traditions in order to provide a visual analogue for the presumed biological differences between whites and nonwhites. These images thus reflect a form of scientific racism that sought to

contain and control the wild, unruly, and chaotic behavior of so-called "primitive" cultures.

Conclusion

The development of techniques for visualizing sounds introduced an epistemic shift in the fields of acoustics and musicology by converting acoustic phenomena into visual inscriptions that could be quantified, analyzed, and classified, thereby transforming sound itself into an object of scientific knowledge. Photography played a key role in this shift, as it was understood by acousticians and ethnomusicologists as a scientific instrument that allowed sounds to record themselves in the form of graphic inscriptions that could be analyzed using mathematics. These inscriptions were understood as objective precisely because of the automatic nature of the apparatus and its ability to preserve indexical traces of sounds in a "dispassionate" and "unprejudiced" manner. The idea of the camera as an ideal scientific observer not only reinforced the scopic regime of modern science but also challenged the widespread notion of photography as a primarily pictorial medium. As Lisa Cartwright points out, "the making of graphic indices was as legitimate a project of photography as the production of pictorial scenes."[56]

W. J. T. Mitchell employs the term "nesting" to describe the representation of one medium "inside another as its content," and he argues that such representations typically emphasize the dominance of the primary medium over the one being nested.[57] The practice of sound photography offers an ideal illustration of this concept, as these images were clearly designed to showcase the perceived dominance of photography over phonography. As a self-recording instrument, photography was considered superior to phonography due to its ability to arrest the flow of time and strip sound recordings of their temporality, which facilitated the mathematical analysis of sounds and the elimination of noise through the privileging of periodic waveforms. The only area in which photography was potentially seen as deficient was its inability to reproduce sounds, yet scientists also demonstrated how the practice of sound photography could be reversed by converting photographs into curves, which could then be phenomenalized as sounds using organ pipes. In other words, photography was seen as superior to phonography because it was capable of not only converting sounds into signs but also converting signs into sounds.

In the 1930s, however, acoustic laboratories began to incorporate new electronic sound technologies that were gradually seen as superior to photography. In his history of architectural acoustics, for example, Paul Sabine notes that in the 1930s "every acoustical laboratory [consisted of] linear response microphones, vacuum tube amplifier[s] and oscillators, sensitive alternating current meters, and telephonic loud speakers."[58] These devices not only allowed for a greater degree of precision, but they also facilitated the analysis of sounds in real time. Electronic sound technologies

also had a tremendous impact on the scientific understanding of sound, as "the scientists who used these tools began to effect similar transformations between sounds and signals in their minds, developing new ideas about the behavior of sound and the physical objects that produced it."[59] While these devices continued to facilitate the analysis of sounds using mathematics, the shift from photographic to electronic instruments inspired new conceptual analogies between sounds and electrical circuits, which displaced earlier concepts inspired by photography, such as "sonic shadows" and "symmetrical sounds." This shift also had an indelible impact on the cultural understanding of photography itself, as the photographic apparatus was increasingly understood as an exclusively visual medium rather than as part of an integrated media network that was capable of translating acoustic, optical, and written information into other medial forms.

Notes

1. Daguerre, "Daguerreotype," 11.
2. Fox Talbot, "Some Account," 206.
3. Fitzgibbon, "Daguerreotyping," 201.
4. Daston and Galison, "The Image of Objectivity," 83.
5. Wilder, *Photography and Science*, 18.
6. Jay, "Scopic Regimes of Modernity," 9.
7. Nadar, "Les histoires du mois," 7.
8. Nadar, *À terre et en l'air*, 272.
9. Ibid.
10. Qtd. in Hankins and Silverman, *Instruments and the Imagination*, 135.
11. Scott, *Le problème de la parole s'écrivant elle-même*.
12. The idea that phonautographic tracings represented sound writing itself was also emphasized in the title of Scott's book *Le problème de la parole s'écrivant elle-même* (The problem of speech writing itself).
13. Le Blanc, "Le monde des sciences et des arts," 1624.
14. Edison, "The Phonograph and Its Future," 533–34.
15. Chladni, *Entdeckungen über die Theorie des Klanges*. In the words of Johann Wilhelm Ritter, these "ur-images of sound" represented "the notation of that tone which it has written by itself." Qtd. in Wetzels, *Johann Wilhelm Ritter*, 91.
16. Sterne, *The Audible Past*, 43.
17. Ibid., 45.
18. Young, "On the Propagation of Sound," 369.
19. Fourier, *Théorie analytique de la chaleur*.
20. Thomson, "The Six Gateways of Knowledge," 282.
21. Stein, "Die Photographie der Töne."
22. Blake, "A Method of Recording," 55–56.
23. Ibid., 56.
24. Frazer, "Some Microscopical Observations," 531–36.
25. Hermann, "Phonophotographische Untersuchungen."
26. Wood, "Photography of Sound-Waves," 218–20.
27. American physicists Arthur L. Foley and Wilmer H. Souder later developed an improved version of Töpler's "Schlieren" apparatus, which was employed by Wallace Sabine in his work on theater acoustics. See Foley and Souder, "A New Method"; Sabine, "Theatre Acoustics"; and Thompson, *The Soundscape of Modernity*, 62–81.
28. For more on Miller, see Fischer, "Acoustics, Appropriated and Applied," 40.
29. Thompson, *The Soundscape of Modernity*, 86.
30. "A Wonderful New Phonograph," 539.
31. Henry, "Where the Eye Supplants the Ear," 456.
32. "Can You Play Your Profile on the Piano?," 44.
33. Ibid.
34. Miller, *The Science of Musical Sounds*, 120.
35. "Can You Play Your Profile on the Piano?," 44–45.
36. Kahn, *Noise Water Meat*, 98.

37. Kunst, *Ethnomusicology*, 9–10.
38. The field of ethnomusicology was initially known as "comparative musicology," as it primarily focused on comparing Western and non-Western musical traditions. The term "ethnomusicology" was introduced in the postwar period to describe the integration of musicology and anthropology, as it examined not only the musical structure but also the cultural significance of non-Western music.
39. Abraham and Hornbostel, "Über die Bedeutung des Phonographen für vergleichende Musikwissenschaft," 229.
40. Bartók, "Why and How Do We Collect Folk Music?," 14.
41. See Myers, "Ethnomusicology," 4; Hui, *The Psychophysical Ear*, 139–44.
42. Densmore, *Northern Ute Music*, 206–10.
43. Seashore, "Phonophotography," 471.
44. Ibid., 466.
45. Ibid., 467.
46. Seashore, *Psychology of Music*, 357.
47. Seashore, "Phonophotography," 466.
48. Metfessel, "Technique for Objective Studies," 5.
49. Metfessel, "The Collecting of Folk Songs," 28.
50. Metfessel, *Phonophotography in Folk Music*, 177.
51. Ibid., 178.
52. Ibid.
53. Ibid., 5. See also Metfessel, "The Vibrato in Artistic Voices."
54. Metfessel, "The Collecting of Folk Songs," 30.
55. Metfessel, *Phonophotography in Folk Music*, 125.
56. Cartwright, "'Experiments of Destruction,'" 143.
57. Mitchell, "There Are No Visual Media," 401.
58. Sabine, "The Beginnings of Architectural Acoustics," 243.
59. Thompson, *The Soundscape of Modernity*, 96.

{ 12. }

Photography, Cinema, and Perceptual Realism in the Nineteenth Century

KIM TIMBY

Viewers were awed by photography, or the mechanical recording of the action of light, when its invention was announced in 1839. The new images made the scene projected inside a camera obscura permanent, and they were incredibly precise, retaining even the most extraneous detail in their rendering of objects, light, and shadow. Half a century later, in 1895, cinematography provided another enthralling spectacle: large, luminous, *moving* photographs. The end of the nineteenth century was a momentous time for photographic imagery. Motion pictures emerged soon after another decisive revolution in the field, to which they owed their practicability: split-second exposure times. The stop-motion photographs this allowed broke with how we saw the world, radically changing ideas about the truthful representation of moving things. Cinema aimed to go in a decisively different direction by animating photography: to simulate our everyday experience of seeing the world in movement. Conceptual associations between photography and cinema in the nineteenth century revolved around such developments in how photographic imagery related to vision. In the interplay between these two media, comparison to vision emerges as an essential mechanism of the social construction of photography's relationship to the real.

I use the term "cinema" to refer to what the Lumière brothers made public in 1895 with their Cinématographe or what systems like the Vitascope also provided: a projected, animated, photographic image in a fairly large format. In doing so, I consider cinema as a technology and as an experience. Other mechanisms for animating

photography were invented before (and after) 1895, but watching a Cinématographe projection resonated particularly well with the public at that moment, creating a major rupture in visual culture. It is therefore a powerful tool for analyzing how what came to be construed as "cinema" was connected to and interacted with photography.[1]

Photography and cinema were of course inextricably linked: photography was cinema's "basic material," in the words of cinema critic André Bazin.[2] Beyond practical questions, however, they were also tied in the public's perception of them as related *photographic* technologies. This relationship had powerful conceptual ramifications because photography and cinema compared differently to our direct visual perception of the world. As I will argue, reference to vision was implicit in the reception of photography. Viewers of the first photographs found them exact yet incomplete with respect to what they would have seen before the camera. To remedy photography's perceived shortcomings, researchers sought in particular to reduce exposure times to aid in the depiction of moving objects. In the 1880s, however, attention was again drawn to photography's disjunction with vision when split-second exposure times produced surprisingly unfamiliar images of a living world. While notions of visual familiarity were thus being challenged and explored, photography-based animation was developed. This endeavor can be understood as satisfying a desire to be able to increase photography's "perceptual realism," or its proximity to everyday visual experience. The precision and unabridged detail of the photographic image encouraged enriching it with additional elements of visual perception—animation, but also depth and color.

In 1895, cinema was judged to be part of the conquest of perceptual realism in photography. Yet the visual experience it provided struck viewers as both lifelike and unnatural. As we will see, this contradictory sentiment reflected how cinema changed the balance of realism in photography, increasing it drastically in some ways but not in others. The effect on photography as a whole was electric. The Cinématographe raised medium sensitivity in the field, unleashing expectations of further mastery of perceptual realism and intensifying discussion about truth in all forms of camera-produced imagery. In this way, cinema was not just a technology that branched off from photography. Its imaginary encouraged lasting dialogue between the two media as each one developed in its own right.

Seizing the Moment

The precision of the first photographs was literally unlike anything seen before. A particularly striking feature of the daguerreotype, made public in 1839 by Louis Jacques Mandé Daguerre, was what contemporaries sometimes called its "exactitude," or its mechanically precise and unabridged rendition of light and shadow. Daguerre supplied viewers with a magnifying glass so that they could marvel at words on signs, cracks in buildings, or even stray leaves invisible to the naked eye. Calotypes, or photographs

from paper negatives, invented by William Henry Fox Talbot in 1841, were also astonishingly exact, although not as razor-sharp. In his publication *The Pencil of Nature*, Talbot declared next to an emblematic photograph of a haystack that photography would "enable us to introduce into our pictures a multitude of minute details which add to the truth and reality of the representation, but which no artist would take the trouble to copy faithfully from nature."[3] Use of the metaphor of a mirror in early descriptions of photography—as when Oliver Wendell Holmes called it "the mirror with a memory"—reveals the sentiment that it was a precise and accurate reflection of the world.[4]

Although the precision of photographs was unprecedented in some respects, early viewers noted that it was wanting in others, especially when a living, changing world was represented. As Samuel Morse famously reported in 1839 upon seeing Paris's busy Boulevard du Temple in a daguerreotype, "Objects moving are not impressed."[5] The picture was populated only by a shoeshine boy and his client, who had stood still on the sidewalk; vehicles and pedestrian traffic were strangely absent. This inconsistency with vision challenged researchers to reduce exposure times. For example, in the early to mid-1840s, when it typically took several minutes to record daguerreotypes of outdoor scenes, chemical mixtures were developed that could reduce exposures to a few seconds in ideal conditions. Marc-Antoine Gaudin thus produced a remarkable view of the Pont Neuf bridge in Paris, complete with pedestrians and carriages (fig. 12.1). It contained motion blur but rendered the bustle of the central thoroughfare.[6] Such efforts are important for understanding how early photography represented the world and what viewers considered visually satisfying. Photography did not "see" the world as we did, and a desire for conformity to vision, not a break with it, drove research on reduced exposure times and the success of processes that provided them.

As is well known, glass collodion negatives, invented in 1851, systematically lowered exposure times from minutes to seconds (although the duration of recording always had much to do with conditions and equipment). In the collodion era, however, exposures did not progressively shrink until "instantaneous" photography was finally and purposefully mastered. The sensitivity of collodion appears to have been generally satisfying, making accessible a wide variety of subjects. Researchers had been interested, however, in devising an alternative that would allow the preparation of glass negatives in advance (not possible with "wet" collodion) without sacrificing sensitivity. Elaborated over the course of the 1870s, the gelatin silver emulsion, or "dry plate," process fit these requirements. It also turned out to be significantly more photosensitive, suddenly and shockingly producing correctly exposed pictures in a fraction of a second—half a second for a group picnicking or 1/500th of a second for a man diving into a pool, for example.[7] Gelatin silver negatives took the world by storm and were in general use by the mid-1880s (not the 1870s, as is often stated), when the industrial production of ready-to-use plates had been established and automatic shutters to control the passage of light into cameras were widely available.[8]

The gelatin silver process brought about an unforeseen revolution in visual representations, one that is essential for charting changing notions of photographic fidelity

12.1 Marc-Antoine Gaudin, daguerreotype of the Pont Neuf, Paris, 1841.

12.2 Anonymous, snapshot of a man jumping, ca. 1900.

around the time of the invention of cinema. It made it easy to produce sharp photographs of all sorts of moving things. Taking pictures of people jumping (as in fig. 12.2), animals running, or waves crashing—or even simply of people walking, laughing, or conversing—became all the rage. These "snapshots" were surprising and engrossing because they stopped actions once perceived only in their continuity. They seized moments that were previously inconceivable because they were impossible to isolate in direct observation. It was even difficult to make sense of some of these photographs at first because they showed things that had never been seen before—like a man frozen in midair who appeared to be dropping from the sky but who had actually been photographed in the process of pole-vaulting.[9] Eadweard Muybridge and Étienne-Jules Marey elaborated their systematic stop-motion studies in this context, pushing photography to new limits. Exploration of gelatin silver's power to halt movement provoked discussion about how photography showed things compared to how we perceived and portrayed them. As in 1839, when city streets appeared empty, attention was again drawn to the fact that photography "saw" the world differently than we did. Where was the truth? Even though Auguste Rodin maintained that photography lied because "in reality, time does not stand still," artists would never again be able to represent a galloping horse as if flying with all four feet off the ground.[10]

Perceptual Realism

At first, reducing exposure times was about producing photographs that looked more familiar. Taken to new extremes in the 1880s, short exposures generated images that broke with our experience of vision. The fact that the new images came to look correct as people became used to seeing them is evidence of photography's far-reaching influence on both mental and visual representations. However, altering disparities between photography and vision, either by bringing the two closer together or by exploiting their differences, remained one of the driving forces behind photographic innovation—technical and aesthetic. For example, the emerging Naturalistic school of artistic photography, spearheaded by Peter Henry Emerson, asserted that to convey perception faithfully the photographer must reproduce the defects of vision using techniques like softer focus.[11] This was largely a reaction against the increasing precision of photography favored by the gelatin silver process and new lenses that reduced optical aberrations. As photography's unprecedented sensitivity to light was explored (in stop-motion imagery or using X-rays, for example) and images gained in exactness, people increasingly questioned the nature of analogies between the camera and the eye, between photography and vision.

At the same time, the inclination to seek a more complete reproduction of vision using photography flourished in a very different way, in the form of "perceptual realism." This concept is pertinent to critical analysis of cinema's impact. I use "perceptual realism" to describe a particular kind of visual familiarity, a form of verisimilitude based on mimicry of human vision and sought by adding to photography elements judged lacking.[12] The notion of perceptual realism helps elucidate how, at the end of the nineteenth century, cinema was received as an extension of photography and seen as evidence of technological progress toward successful simulation of the experience of vision.

Photography's mechanically produced exactitude favored the sentiment that it offered a faithful image of the world. Early inventors and observers regularly expressed the idea that with photography, nature drew itself.[13] Why, then, shouldn't a photograph be a flawless representation? Why shouldn't it be possible to make it record elements of visual perception currently found wanting? Moving things were not the only source of discrepancy identified between photographs and vision. Color was also blatantly absent. Nicéphore Niépce remarked upon this when defining the very essence of his invention in 1827: photography was a way of "fixing the image of objects by way of the chemical influence of light, fixing this image exactly except for the diversity of its colors."[14] Along with the erasure of moving objects, photography's monochromatic nature was glaring evidence that photographic and human perception differed in important ways, further challenging inventors.

The pursuit of perceptual realism in photography was steeped in scientific research on vision, which had undergone important developments in the first decades of the nineteenth century. Perceptions of movement, color, and depth were significant

phenomena open to analysis. A powerful type of experiment was to induce them using carefully devised images or other stimuli presented to the viewer in a particular way.[15] In 1832, for example, Joseph Plateau demonstrated that an illusion of movement could be created using a series of drawings of the same object in slightly different positions presented to the viewer in rapid succession. He did this with his “phenakistiscope,” a device fitted with disks similar to the one pictured in figure 12.3.[16] Likewise, in 1838, Charles Wheatstone invented stereoscopic images, arguing that if the brain deduced the volumes of an object using binocular vision—two eyes with a slightly different perspective on things—then an illusion of depth could be created by presenting each eye with a drawing of the same object as seen from a different angle. These optical gymnastics were facilitated by placing the two images in a “stereoscope.”[17] Color vision was also thought to be about synthesizing distinct elements. In 1802, Thomas Young had hypothesized that we see a diversity of colors thanks to only three kinds of receptors in our eyes. In the 1850s, James Clerk Maxwell made an essential experimental contribution to this theory with a spinning top fitted with adjustable colored disks that allowed the precise study and definition of the colors perceived as different quantities of “primary” colors were combined.[18]

In the early years of photography, the idea of associating its precision with composite illusions of movement, color, and depth—until then obtained with manually produced elements—was appealing. This was visually spectacular, and it was intellectually stimulating because it brought “missing” elements to photography by mechanical means that imitated the workings of our own visual apparatus. Stereoscopic photographs, providing a sensation of depth, were the earliest example of the establishment of perceptual realism in photography. First made in 1840–41 in academic circles, they became commercially popular starting in the early 1850s. Animated photography was developed soon after, with pioneering examples of the 1850s–60s presenting series of photographs around the perimeter of a disk.[19] Completing the trio of effects closely associated with perceptual realism, the first successful photograph to record the colors of an object mechanically was devised by Maxwell in 1861. The subject (a plaid ribbon) was photographed three times through filters of different colors; the images were then simultaneously projected through appropriately tinted individual filters so that they overlapped on a screen, where their colors blended to reconstruct the subject’s natural hues.[20]

In the years before the invention of cinematography, images with mechanically recorded and rendered depth, animation, and color were curious and exciting to behold. Enthusiastic inventors and daring entrepreneurs even combined them to create attractive novelties that attempted to up the ante in terms of perceptual realism—or at least bring together several spectacular effects. This was tempting because depth, animation, and color were all associated with a more complete reproduction of vision. It was also encouraged by the fact that obtaining each of the three illusions was based on the creation and synthesis of multiple images.[21] The animated stereoviews imagined in 1860 by photographers Furne and Tournier are just one example of such

12.3 Phenakistiscope-style disk, 1830s.

associations. Figure 12.4, for instance, pictures a man working a lever on a machine. The left and right images show the subject from different angles to provide depth; they also picture part of the subject—the lever and the man's arms—in different positions to render a simple animated effect. The card was to be viewed in a "stereoscope used like a phenakistiscope," equipped with a shutter so that the images were seen in rapid alternation.[22] Many of the first inventors to develop animated photography combined it with stereoscopy.[23] The development of three-color photography techniques toward the end of the century provided new occasions to associate illusions based on multiple images. One of the most striking examples was Frederic Ives's stereoscopic Kromskop (ca. 1898), a device used to admire commercially produced sets of three black-and-white stereoscopic pairs recorded through differently colored filters; the result, seen inside the filter-equipped device, was a view of the subject with vibrant color and concrete-seeming volume.[24]

12.4 Furne et Tournier, stereoview providing an illusion of movement, ca. 1860.

Adding stereoscopy, animation, or color to photography made it more complicated than traditional photography; combining these illusions multiplied the constraints. The fact that numerous inventors rose to the challenge is evidence of the draw of perceptual realism and of the strong associations the nineteenth-century public made between these three visual effects.[25] Writing in the 1920s, cinema historian Georges Potonniée even convincingly argued that the invention of stereoscopic photography was what elicited research on animated photography, which had not been attempted before the start of stereoscopy's vogue at the Great Exhibition in London in 1851.[26] For inventors, photography's exactitude encouraged its association with depth, animation, and color, and the addition of one new illusion to photography called for others. For an even wider public, firsthand experience of photographs augmented in various ways fueled rising certitude that a "complete" reproduction of vision would one day be possible.

The Definitive Solution to Animating Photography

Research on pausing movement and on reproducing movement existed in largely separate spheres until the invention of gelatin silver photography. The ability to photographically "stop" motion was necessary from a technical standpoint for the invention of cinema. It may also have helped give form to the desire for a cinematic image: with the new dry plates, it was possible to photograph the modern, moving, fleeting world, but these images could look frustratingly inert. One specialist incisively remarked, "Those who start working with instantaneous photography are set on seizing a fast-moving train. The task is frustrating, however, because if the picture obtained is sharp, then the train appears to be absolutely still; the photographer's

assertion . . . is the only guarantee of the instantaneousness of the exposure."[27] Cinema would bring the movement back.

Stop-motion photography created a visual shock in the 1880s. It transformed how moving things were portrayed and made many previously created pictures look *wrong*. In comparison, early animated sequences made using stop-motion photographs apparently looked *right*. Starting in 1878, series of such images recorded by Muybridge, then Marey, were being presented in zoetropes. Although an illusion of movement was not the ultimate goal of their studies, this movement looked natural and therefore provided visual assurance that the individual images were faithful excerpts of reality.[28] Photographic animation wasn't jarring like the first instantaneous photographs: it showed something that seemed quite familiar. It was a mediated reality that was fascinating to observe.

When the Cinématographe was unveiled for the public, one might expect that it provided an even more familiar sight. In fact, it was a surprisingly novel visual experience. Charles Musser has underlined in his analysis of changing conceptions of truth in cinema that the impression of truth is relative; new points of comparison change perceptions.[29] This notion of comparison is essential here. Cinema presented an image that in some respects was unprecedented in its convincing simulation of direct perception of the living world—including, but not limited to, lifelike movement. However, that very naturalism emphasized the new spectacle's unnaturalness in other respects. By thus changing the balance of verisimilitude in photography, cinema raised expectations of further mastery of perceptual realism. Critically examining this mechanism requires an understanding of how, at the end of the nineteenth century, cinema was closely associated with photography and of why cinema constituted a particularly naturalistic experience of photographic animation.

In 1895, photography and cinema were inextricably linked in the minds of contemporaries. When the Cinématographe was made public, it was frequently called "animated photography." It was "a photographic marvel," in the words of a journalist at *Le Radical*.[30] Cinema was photography with something extra. Comments to this effect abounded in the first accounts of Cinématographe viewings. "Imagine a screen," prompted *La Poste*. "On the screen a photographic projection appears," then "all of a sudden the image . . . animates and comes alive."[31] While rightly remaining circumspect, scholars have underlined that many early accounts of motion picture projections expressed awe at their realism.[32] Theater director Jules Claretie declared in 1896 that cinema was "reality itself," "everyday life scrupulously noted by an instrument."[33] For *Le Radical* (cited above), it gave "every illusion of real life."[34] Progressively, the idea took hold that spectators were duped by cinema's realism, even panicking as a locomotive approached in one successful Lumière film.[35] Although such claims were exaggerated, it is telling that cinema elicited this narrative and that extreme realism became a part of its mythology.

Equally revealing are remarks regarding shortcomings in cinema's verisimilitude. Numerous commentators, while declaring that their overall impression was strikingly

realistic, noted the absence of color and sound. Claretie, cited above, called cinema "reality itself" but wondered what it would be like when one day it was in full color and accompanied by sound, thanks to the phonograph.[36] For those who reacted the most intensely, cinema's incompleteness made it disturbing. In a much-cited 1896 critique, Maxim Gorky related, "It is terrifying to see this gray movement of gray shadows, noiseless and silent."[37] (This monochromatism, without the eeriness, is depicted in the Cinématographe poster in figure 12.5, where everything is shown in color except the scene being enjoyed by the crowd.) Marveling at cinema's verisimilitude and criticizing its truncated representation of the world were related: viewers acknowledged successful perceptual realism while noting its deficiencies, implicitly or explicitly expressing an expectation that it would soon be taken further.

Cinema raised expectations of perceptual realism by adding to the combination of lifelike effects already constituted by the association of photography and animation. One of the ways it did this was by projecting an animated image, and specifically by projecting a large-format animated image, in front of the viewer. This was more consistent with everyday vision than other popular ways of presenting animated photography—like bending over a Kinetoscope or pressing one's eyes to a Mutoscope to see a small moving image inside the device. Watching a Cinématographe projection was more like looking directly at the world or like seeing things on a stage or through a window—an impression given by the way the experience was represented in the promotional poster pictured in figure 12.5. In 1896, a Mexican observer, the poet Gonzaga Urbina, vividly underlined this as an "important advantage" of the Cinématographe over its "rivals." "There is no need to hide behind a lens in an uncomfortable position in order to surprise what is beyond the brightly lit crystal," he wrote. "There is no need to don fake pupils to see this world of marvels. One only has to come inside and sit comfortably in front of a white rectangle opening at the end of the room."[38] This projected cinematic image was also touted in early accounts as being natural in size. This was not strictly the case (the image measured no more than five by eight feet, while subjects ranged from small objects like fishbowls to widely framed outdoor scenes), but the format appeared convincingly lifelike compared to that of any other form of animated photography.[39]

Cinema's large, outwardly visible, moving, photographically exact image was also unprecedented in its seamless presentation, with far-reaching implications. The devices and multiple photographs on which it depended were detached from the perceived image. As accounts from the end of the nineteenth century relate, it was as if the photograph on the screen was magically animated and came to life. The introduction around the same time of more seamless ways of viewing stereoscopic and color photographs—which also provided perceptual realism based on the synthesis of multiple images—shows that this kind of simplification was attractive. For color, this was being done using screen processes like the Joly system (1895), then the Lumière company's successful Autochrome plate (1907), which combined the three separate colored filters once required—and the three resulting images—into one. The same principle was

12.5 Marcel Auzolle, poster advertising the Cinématographe, 1896.

used to create "autostereoscopic" photographs, providing depth without a stereoscope.[40] Like the Cinématographe, these processes presented their illusions in a way that veiled the artifices on which they depended. These new forms of stereoscopy, color, and animation were much more "phantasmagoric" than the traditional ones, to adopt Jonathan Crary's use of the term: they were better at "the effacement or mystification" of their operating principles.[41] This phantasmagoria contributed to a shift in attention from the technical foundations of the process at hand toward the illusion it procured. It thus heightened awareness of the illusion's premise of naturalism—and of its shortcomings when compared to the familiar, everyday experience of vision it purported to transcribe.[42]

Increased naturalism and phantasmagoria contributed to making "cinematography" appear to be the definitive solution to animating photography. At the same time, they aroused a desire for more perceptual realism, in photography and cinema, by underlining cinema's remaining discrepancies with life—notably sound and color. Cinema's impact on ideas about photography was further strengthened by new research that finally appeared to be making color photography a reality. Gabriel Lippmann's 1891 invention of a process based on the recording of interference patterns was highly respected, although impractical. More accessible devices that facilitated three-color photography, including Joly's system and Ives's Kromskop, were marketed starting in 1895.[43] As described above, ideas about color, animation, and stereoscopy were

intertwined, and their combination was captivating; new forms of each visual effect drew added public attention to the others. The simultaneous attainment of impressive new technologies for photographically recording color and animation strengthened the sentiment that mastery of perceptual realism was within reach. It stoked expectation of a perfectly complete image—famously qualified as the "myth of total cinema" by André Bazin in 1946, when recent sound and color technologies in movies were whipping ideas about the attainment of unabridged perceptual realism into a frenzy.[44]

Photography and Vision

Around the time of World War II, when Bazin summoned the idea of "total cinema," numerous authors writing on photography, cinema, sound recording, and stereoscopic techniques expressed the idea that these different lines of research were converging to make possible a complete rendition of our visual experience of the world. Fascination with progress toward perceptual realism had been fueled by the arrival of the sound era in cinema at the end of the 1920s and by new technologies for filming in color, such as improved Technicolor processes (1928, 1932), then Kodachrome (1935). Each new element of perception brought to cinema made another appear more blatantly absent.[45] Robert Spadoni has argued that sound raised "medium sensitivity" in cinema, making viewers particularly aware of details in a way they had not been since the end of the nineteenth century, when cinematography was new.[46] The mechanism was the same at the end of the nineteenth century: in 1895, the experience of cinema activated medium sensitivity in photography in a way reminiscent of the situation around 1839. The quest for perceptual realism went back to photography's beginnings, but the Cinématographe's seemingly definitive solution to animating the photographic image intensified a discussion about realism and truth in the mechanical recording and restitution of "vision" that would last well into the twentieth century.

Photography flourished in the nineteenth century in particular because it made it possible to record what other technologies such as microscopes, telescopes, trains, and X-rays allowed us to see. It made these sights and more everyday ones permanent and transportable, made it possible to see them again and again, and made it possible to see them vicariously. Photography also allowed the creation of sights that would not have existed otherwise. In this way, it accompanied, relayed, and extended vision. It was the basis for powerful new forms of mediated experience that exploited its capacity to enable the mechanical inscription and restitution of multiple aspects of visual perception—however approximate or open to manipulation. The advent of cinema initially increased the longstanding desire to combine movement, color, and/or depth in the same photographic image. However, it did not lead to the unbridled creation of images that were as "realistic" as technically possible. Nor were effects associated with perceptual realism always a serious affair, with their potential to awe and entertain. Instead, growing technical mastery of perceptual realism and the medium

sensitivity it elicited encouraged photographers and cinematographers to reflect upon the expressive possibilities of the tools available to them. As the author René Barjavel put it in 1944 when pondering the future of cinema, "The more the vocabulary of cinematography—a vocabulary of images, colors, and volumes—is enriched, the more film authors will have to work within a rigorous syntax. Not to restrict themselves to a dull realism but, thanks to the material impression of truth, to sweep the crowd directly into the heart of poetry."[47]

Notes

1. Analysis of the manifold ties between photography and cinema is drawing increasing attention from historians. See, e.g., Albera, Braun, and Gaudreault, *Arrêt sur image*; Campany, *Photography and Cinema*; and Guido and Lugon, *Between Still and Moving Images*.
2. Bazin, "In Defense of Mixed Cinema," 62.
3. Talbot, *The Pencil of Nature*.
4. Holmes, "The Stereoscope," 739.
5. Morse, letter to *New-York Observer*, 62.
6. See Gaudin, letter to the Académie des Sciences, 832–33. Gaudin claims to have exposed a view of the Pont Neuf for one-nineteenth of a second, but this seems unlikely considering the aspect of the image here.
7. Dillaye, *La pratique en photographie*, 141–48.
8. For an overview of development of the gelatin-silver process, see Ward, "Dry Plate Negatives."
9. Example used by Eder, *La photographie instantanée*, 203–4.
10. Rodin, *Art*, 32. For more on this revolution in representations, see Frizot, "Comment on marche."
11. Emerson, *Naturalistic Photography*, 22–24, 97, 114, 119.
12. Other scholars have used the term "perceptual realism" in different ways. In particular, Stephen Prince applied it in film theory, when analyzing the implications of computer-generated imagery, to describe accurate representation of "the viewer's audiovisual experience of three-dimensional space" (Prince, "True Lies," 32).
13. See, e.g., Batchen, *Burning with Desire*, 62–69, 90; Brunet, *La naissance*, 135–39; and Lastra, *Sound Technology*, 73–74. Lastra points out the same tendency in the history of sound recording.
14. Niépce, letter to William Townsend Aiton, October 16, 1827, in *Niépce correspondance et papiers*, 789 (my translation).
15. On the creation of images based on research on visual perception, see Crary, *Techniques of the Observer*.
16. On early animated imagery, see Mannoni, *The Great Art*, 199–263.
17. On early stereoscopy, see Crary, *Techniques of the Observer*, 116–28; and Pellerin, "The Origins," 43–48.
18. Harman, *The Scientific Letters*, 1:16–17, 284–86, 287–89.
19. See Mannoni, *The Great Art*, 238–47.
20. Maxwell's image was produced with the photographer Thomas Sutton. For illustrations, see Pénichon, *Twentieth-Century Color Photographs*, 10–11, 14; and for an in-depth study, see Cat, *Maxwell, Sutton, and the Birth of Color Photography*.
21. On these parallels, see Timby, "Stereoscopy and Colour."
22. Furne fils and Tournier, "Stéréoscope animé" (my translation).
23. Mannoni, *The Great Art*, 235–47; and Mannoni, "The 'Feeling of Life.'"
24. On the stereoscopic Kromskop, see Coe, *Colour Photography*, 34–42; and Timby, "Stereoscopy and Colour," 186–88.
25. For a few other examples of the combination of illusions, see Plunkett, "Depth, Colour, Movement."
26. Potonniée, *Les origines du cinématographe*, 20–23.
27. Eder, *La photographie instantanée*, 86 (my translation).
28. On this practice for both popularization and scientific "reverse verification," see Frizot, *Étienne-Jules Marey*, 109–114, 240.

29. Musser, “Changing Conceptions of Truth,” 70.
30. “L’illusion,” 39 (my translation). For other instances of cinema as “animated photography,” see Gaudreault and Gauthier, “Could Kinematography be Animation?,” 88; and Timby, *3D and Animated Lenticular Photography*, 48.
31. *La Poste*, “La mort cessera,” 41 (my translation). The projected image first appeared still because the projectionist framed a single image to correctly align the filmstrip before starting to crank the Cinématographe. See Loiperdinger, “Lumiere’s *Arrival of the Train*,” 97.
32. See, e.g., Lastra, “From the Captured Moment.”
33. Claretie, “Le spectre,” 42–43 (my translation).
34. “L’illusion,” 39 (my translation).
35. See Loiperdinger, “Lumiere’s *Arrival of the Train*.”
36. Claretie, “Le spectre,” 42–43 (my translation).
37. Maxim Gorky cited in Gunning, “Animated Pictures,” 100. Gunning further analyzes Gorky’s reaction. See also Banda and Moure, *Le cinéma*, 47–57.
38. Gonzaga Urbina, “Le sentiment de la réalité,” 44–45 (my translation from the French translation).
39. On projection format, see Loiperdinger, “Lumiere’s *Arrival of the Train*,” 96–97. On its importance to the perceived fidelity of cinema, see also Musser, “Changing Conceptions,” 83.
40. First described in 1896, then commercialized in 1902 by Frederic Ives, autostereoscopic photographs interlaced the two images of a stereoview behind a lined screen placed at a slight distance from the composite picture. Thanks to parallax, each eye saw a different image and an illusion of depth appeared. See Timby, *3D and Animated Lenticular Photography*, 23–41.
41. Crary, *Techniques of the Observer*, 132–33.
42. I argue this change of focus based on the study of autostereoscopic imagery in Timby, *3D and Animated Lenticular Photography*, 37–41, 64, 69.
43. On the history of color processes, see, e.g., Coe, *Color Photography*; and Pénichon, *Twentieth-Century Color Photographs*.
44. Bazin, “The Myth of Total Cinema,” 17–22.
45. Timby, *3D and Animated Lenticular Photography*, 126–31.
46. Spadoni, *Uncanny Bodies*, 13–14.
47. Barjavel, *Cinéma total*, 54 (my translation).

{ 13. }

The Double-Birth Model Tested Against Photography

ANDRÉ GAUDREAULT AND PHILIPPE MARION

In the domain of painting and statuary, the present-day credo of the worldly wise, especially in France . . . is this: "I believe that art is, and can only be, the exact reproduction of nature. . . . Thus if an industrial process could give us a result identical to nature, that would be an absolute art." An avenging God has heard the prayers of this multitude; Daguerre was his messiah. And then they said to themselves: "Since photography provides us with every desirable guarantee of exactitude" (they believe that, poor madmen!) "art is photography."

—Charles Baudelaire, "The Modern Public and Photography," 1859

A medium is always born twice! The phrase sounds like a slogan, or even the title of a manifesto. It is true that in its first formulation, starting in 1999, our "double-birth"[1] model was intended to be provocative, especially in the paradoxical use of the term "birth."[2] It is also true that it is more appropriate to talk about the *advent* of a medium rather than of its *birth*. For us, it was a question of using this biological metaphor for defining, on the one hand, the invention not of cinema between 1890 and 1895 but of a *simple device for capturing/restoring* moving images (of which the Lumière Cinématographe was the most successful example) and, on the other hand,

the establishment, around 1910–15, of an *institution for producing and exhibiting* animated pictures (cinema).[3] As we have argued previously, the following premises are now essential to any conceptualization of the history of cinema:

- It is a little too facile to date what is commonly called "the invention of cinema" to the year (around 1895) of the invention of a mere technological device for projecting photographic images on a screen to give the illusion of movement.
- Cinema is a complex sociocultural phenomenon that cannot be reduced to the mere projection of images.

Let it be said: cinema is not a *device*. It is a *social*, *cultural*, *and economic system*. Cinema was not invented; it was constituted, it was instituted, and it was institutionalized (which occurred around 1910, some fifteen years after the invention of the Lumière Cinématographe).

The basis of and justification for our *double-birth* model—even today, in the digital age—is the rejection it implies of any simplistic and one-dimensional conception of a phenomenon as complex as the emergence of a new medium. But before considering its relevance in the field of photography, we should first perhaps sum up what we mean by the double birth of a medium and how it applies to cinema.

The "Classic" Double-Birth Model of Cinema[4]

Looking closely at the so-called birth of cinema, one can see that its singular media identity was far from evident from the outset. What we still call today "early cinema" was in fact a kind of hodgepodge of other expressive forms. Before *cinema* succeeded in establishing itself as a medium with clearly defined boundaries, the *kinematograph* had merged into an existing media and cultural environment: the new device was more or less explicitly seen as a means for recording and reproducing already existing entertainments and live attractions, whether natural or staged. The first ambition to which the new machine gave rise was to exploit its ability to reproduce and amplify already well-established cultural practices and sometimes to make them more forceful. In short, it was used for its simple status as a recording machine.

The invention of the "base apparatus" was certainly a turning point in the evolution of photographic recording technologies, but at the same time that it was a moment of fascination, such an invention did not give rise to a new *paradigm*, a new order. In other words, the appearance of devices such as the Kinetograph and the Cinématographe was not a true moment of rupture.

The emergence of a device for the recording of moving photographic images did not lead immediately to a new cultural, artistic, or media order. In our view, the case of cinema is exemplary because of the scorn elicited by the appearance of its technological procedure of *capturing and restoring* reality, a fascinating novelty that has

mistakenly been seen as constituting the medium's sole identity. On the contrary, cinema's quest for singularity as a recognized medium is part of a long development process and can in no way be confused with its "first birth," which was the product of mere technological progress. We must wait for kinematographers to acquire a reflexive understanding of their means of expression and for the cultural practice of cinema to attain a certain level of institutionalization for the medium to achieve a degree of autonomy. This is the sense in which we mean that a medium *is always born twice*. Its first birth takes place when a technological innovation is used to give new life to existing cultural practices and series, under whose authority this technology places itself. A second birth occurs when the expressive resources made possible by a technological apparatus that has *become* a medium achieve institutional legitimacy and work toward establishing the specificity of these resources as the norm.

In fact, this model took place in three stages: three processes we have identified by three terms located in the same semantic field but to which we have assigned a specific connotation. These three terms are *appearance*, *emergence*, and *advent*. Early film history thus leads us from the *appearance of a technological apparatus* (a technology), the moving picture camera; to the *emergence of a sociocultural apparatus*, perhaps even a new cultural series, that of animated pictures; to the *advent of a sociocultural institution*, that of cinema.

After the appearance of the recording device, the production of films *defined itself as a practice* that had to make possible the passage to another stage: the emergence of animated pictures. This was the first example of "film culture," whose institutionalization, however, was yet to be carried out. This culture, while it remained resolutely and necessarily intermedial, was marked by its status as being in the process of institutionalization, in that it came out of a patchwork of neighboring institutions that did not yet share a common definition of what cinema should be. It was out of this unstable cultural broth that the kinematograph set out on the path that would transform it into an autonomous expressive medium and raise it up as a singular and well-established medium. Cinema could then plunge headfirst into its second culture, that of its second "birth," that, this time, was truly "media-centric."

The Model Tested Against Photography

Does our model remain relevant as a paradigm when tested against the genealogy of photography? Before we address this question, a conceptual clarification is necessary. Like all explanatory "grids," the double-birth model should not be applied mechanically in every context. Indeed, there is a high risk of distorting the meaning of the data and facts in imposing on them, at all costs, the correct profile for entering a given "drawer" in the model. This application only serves to reinforce the distortion. The totalitarian (or even "fascist")[5] impulse of any model should never be underestimated. Rather, for us it is more a question of using such a model as a prototype, a framework

that serves to draw out deviations and convergences between different media from a comparative perspective. In this regard, we will see further on the extent to which a genealogical interpretation by way of a *cultural series* approach is complementary with the double-birth model.[6]

Extending between two births and structured in three phases, our model is capable of tracing a general movement of the medium under study, but this movement should not be seen as a long, quiet river. Thus, in the case of the medium that constitutes our prototype—cinema—it should be noted that its institutionalization itself was far from being a monolithic process. Many popular practices proliferated around and on the margins of this institutionalization. Ultimately, institutionalization always develops in the plural (cinema never stops being reborn, never stays the same, and is in a state of constant evolution/transformation). The case of photography, more than that of institutional cinema (which is to say, the institution of fiction cinema consisting of feature films screened in institutional theaters), is far from one and indivisible. Although institutional cinema is complex, it remains such a powerful and preponderant reference point that even when we consider other cinematic forms, we must view them in light of institutional cinema and measure them against it. This is less true of photography, however, as its process of institutionalization was far less rigid. In terms of photography, a simple reading (simple because too all-encompassing and too academic) could be advanced at first (which is what we outlined in our original article). One could envision, for example, a history of the photographic medium that starts with Nicéphore Niépce's invention of heliography (the *appearance* phase), is followed by the public emergence and institutionalization of the daguerreotype (around the 1840s), and arrives at the first advent of the medium, which was established by serious practitioners with the creative talent of someone such as Nadar. Like many of his colleagues, Nadar never hesitated, from 1854 onward, to express his faith in the singularity of the new photographic medium, whose identity as a technique for capturing/restoring the impression of light was already well established in the French society and culture of the time and spread by the enthusiastic practices of a growing number of users.[7]

A Diffuse and Fascinating Medium

Obviously, studying the conditions for the emergence of photography involves particular challenges. Various authors see its development as emblematic of the history of contemporary media. Some even claim that the invention of photography is a sort of mirror image of the invention of printing. According to Régis Debray, whose ideas fall in line with Walter Benjamin's, the invention of photography represents the true birth of our media culture, or at least our entry into a new media universe.[8]

While photography was invented in the first quarter of the nineteenth century, it nevertheless partakes in a much older serial pursuit—that of fixing and preserving an image of reality, such as found in the light "mediated" by our eyes.[9] It was then a

question of figuring out how to develop a recording device that was capable of capturing and faithfully reproducing a part of our visual reality. This is what made possible heliography, invented in 1816 by Nicéphore Niépce.

It would not be until 1826 that this technique produced what is now considered the oldest photograph: *View from the Window at Le Gras* (taken in Saint-Loup-de-Varennes, France). In 1835, the Englishman William Henry Fox Talbot produced the first known negative. These are the defining moments of the appearance phase of this new technology. All of the founding principles of photography were nearly in place. A few years later, Daguerre would perfect his technical process and, perhaps more importantly, make it available to the public. A landscape painter, Daguerre quickly grasped the importance of Niépce's technique for his own work. But Daguerre was also a showman and so began working on new procedures for enlivening the technical process, thus offering the public the opportunity to discover photography.

Like the invention of the motion picture camera, the invention of the daguerreotype is rather a turning point (there will be many more) in the evolution of photographic technologies. However, in spite of the fascination it produced, it did not cause a sudden transition to a new *paradigm*, perhaps only, at this stage, superficially changing the order of things. The real *moment of rupture* was located elsewhere. We are tempted to say it probably occurred in the widespread proliferation of the medium in social uses. This situation was itself encouraged by other techno-industrial innovations. This was the case with the new printing technique developed by Blanquart-Evrard, who went on to "found, in 1851, the first 'photographic print shop' with a view to industrializing the production of photographic prints and making this work profitable."[10] By the mid-nineteenth century, users seem to have become aware not just of the originality of the new means of expression but also of its singular nature. It is as if photography had implicitly acquired a medium identity through these social uses, as if users became agents of institutionalization beyond an initial novelty effect.

This "institutionalization through uses" had been anticipated, in part, by Arago during his presentation at the French Academy of Sciences in Paris on January 7, 1839. His passionate speech is an exemplary reflection of the final identity associated with the appearance phase of the new technique: the *novelty* effect and the element of attraction.[11] Arago describes the new daguerreotyped images as containing such fine detail that no illustrator could ever equal them. In spite of reservations from prominent figures, such as Balzac but especially Baudelaire, there was a genuine craze for the invention of the daguerreotype plate, as illustrated in M. A. Gaudin's 1844 *A Practical Treatise on Photography* (*Traité pratique de photographie*): "Optician shops were crowded with enthusiasts yearning for a daguerreotype. We could see them everywhere pointing at monuments. Everyone wanted to copy the view from their window, and happy were those whose first shot included the silhouette of the rooftops against the sky. They became ecstatic shooting stovepipes; they ceaselessly counted roof tiles and chimney bricks . . . ; in short, the simplest print caused them unspeakable joy, as the technique was still new, and seemed understandably wonderful."[12]

From a diachronic perspective, photography appears as a result of long historical processes rooted in the eighteenth century, most notably with research on the sensitivity of silver salts (silver nitrate or silver chloride) to light, even if we would have to wait until Niépce's heliography to solve the problem of fixing the image. The same is true of its intermediality but at a synchronic level this time: we know that Daguerre was a landscape painter and especially a scenographer of illusionism. Celebrated by Balzac, Daguerre's Diorama, a show based on light and *trompe-l'oeil*, was quite popular with Parisians and passing travelers. As Quentin Bajac writes, "photography, at the intersection of optics, painting and chemistry, required knowledge he was able to draw on when perfecting the daguerreotype."[13]

The daguerreotype only made possible the production of unique prints on metal. In the following years, the daguerreotype plate was gradually rivaled by paper photography and glass negatives. The new "medium," still in a process of definition, was merely seen as a surprising or amusing way of capturing reality—or, more precisely, of producing a "realistic" image—without the need to learn drawing or painting. Photography thus remained fixed within the spectrum of the dominant pictorial practices. As Eliseo Verón has well noted, photography was a more efficient way of producing, among others, the genre of pictorial portraits so dominant at the time, especially popular with the elites.[14] In terms of monstration,[15] it also mimicked some of its associated practices, such as the scenography of postures and the theatricality of attitudes.

To use an expression mentioned earlier, photography was partly a new way of continuing what had always been done. Indeed, it offered the cultural series of bourgeois pictorial portraits the opportunity to spread anew, without revealing its potential as a cultural series or its status as an emergent medium. We are thus witnessing the establishment of a new device and the emergence of a new practice based on techniques that were in the process of being put in place. This is our phase two, which is to say, the moment when an initial culture of photography came into being, even if it was still unable to clearly demarcate itself from surrounding cultural practices.

Nadar, One of the "Agents" of Institutionalization

Next is the advent phase (our phase three) and also that of the second birth, characterized by an emerging consciousness of the expressive autonomy of photography as well as its medium specificity—two features Nadar himself seemed to reveal over the course of an artistic career that displayed a growth in media consciousness. As a great caricaturist, Nadar first saw the new technology as a way to renew—and to improve—his artistic practice. Alongside continuing improvements to the technology, especially with the appearance of the negative, developed by Talbot in 1841 (calotype process) and by Abel Niépce de Saint-Victor in 1847 (albumen process), Nadar highlights the relative ease of learning the medium ("the theory of photography can be learned in

one hour, the practical aspects in a day").[16] But above all, he emphasizes the promising new horizons that photography appears to open:

> What cannot be learnt . . . is the feeling of light—it is the artistic appreciation of the effects that various and combined days produce—it is the application of this or that effect depending on the nature of the physiognomy. . . . What is even harder to learn is . . . that quick instinct that opens a connection with the subject . . . and that enables you to create, not an ordinary or accidental visual reproduction within reach of the least laboratory scientist, but . . . an inner likeness. This is the psychological side of photography, a word that does not seem too ambitious.[17]

We can see in these remarks an original conception that Benjamin would later take up in his "Short History of Photography," as André Gunthert points out in his reading of Benjamin's text: "the idea that photography, beyond mere representation, provides access to one's very being, even the secret of existence, in its most intimate aspect (with its declination on the aesthetic level: going beyond art by means of photography)."[18] It would obviously be excessive to claim Nadar alone represents our institutional advent phase of the photographic medium. Moreover, the traits that define the singularity of this visual means of expression remained fluid, evolving in line with new photographic techniques that frequently put this singularity into question. One could further mention, in this regard, the rather decisive moment of the advent of the snapshot in the 1880s, which amplified and promoted discussions about photography, not just as a moderately artistic phenomenon but as a unique art; this may constitute, precisely, another facet of the institutional dynamic. The snapshot would gradually replace the studio portrait and become widely accessible to hobbyists. In terms of practices and uses, photography's institutionalization process can also be linked to the considerable and widespread success of the carte de visite portrait, whose patent was filed in 1854 by Eugène Disdéri, a French photographer who was also a staunch champion of photography as art.[19]

While Nadar appears to have been one of the "actors," one of the first "instruments" of the institutionalization of photography, it is important to consider the various signs of the second, "institutional" birth of the medium, which effected a "closure of flexibility" of the medium, according to the Social Construction of Technology model.[20] The French photography historian and theorist André Rouillé provides a fairly complete inventory of the "symptoms" indicating this quest for institutional identity:

> From the very beginning, in 1839, but especially from the 1850s onwards, a body of literature on photography was established. In addition to magazines and numerous specialized books there were exhibition reviews, patents, minutes of Société française de photographie meetings, requests addressed to the ministry of fine arts, journalistic accounts of trials, newspaper articles for or against photography,

artists' petitions against it, statistical investigations, studio tariffs, newspaper chronicles, advertisements, etc. . . .

. . . It was a time when, from a very early age, photography simultaneously had to hammer out technical instruments, ensure a market, become equipped with institutions, develop a theoretical discourse, and act in ways which would bring it legitimacy.

Through this variety of actions, the photographic milieu simultaneously established itself and resisted the efforts of competing milieus (beginning with that of engravers).[21]

An Ontological Perspective on Photography's Identity

As Walter Benjamin pointed out, the daguerreotype presents "the earliest image of the encounter of machine and man,"[22] because it is a device that "records our likeness without returning our gaze."[23] From McLuhan to Barthes, several authors have highlighted the authenticity effect attributed to the "photographic recording." It possesses, Barthes insists, a strong connection to the referent: "The Photograph is pure contingency and can be nothing else."[24] This unique testimonial capacity of photography, which seems part of its identity and reputation as a medium, must itself be placed within a historical perspective. Such contextualization obligates a qualification of the "thesis of existence," essential to what Jean-Marie Schaeffer has defined as the "photographic *arché*."[25] It is, incidentally, this record of existence, this proof of presence, that Baudelaire quickly grasped, even if, to his elitist eyes, this aspect of photography should remain in a secondary role as a simple add-on. For Baudelaire, photography cannot aspire to become an art. At most it can stand in for art "in some of art's activities." It must therefore replace an existing art by being (and remaining) its "humble handmaid." Photography is there to assist.[26]

These "madmen" industry types (whom Baudelaire opposes to artists) believe that in fact photography "provides us with every desirable guarantee of exactitude,"[27] in perfect agreement with the famous "thesis of existence."[28] It must also be said that this existence thesis can only be implanted in the photograph when one understands the basic device: something real has been mechanically recorded and faithfully restored. The photographic *arché* is similarly placed into context, we have seen, in the undefined phase of the medium that surrounds the moment of photography's birth (absorbed into its surrounding intermediality).

A comparable phenomenon is observable in the social uses of culture-specific media. According to Schaeffer himself, and contrary to popular belief, members of primitive tribes untouched by civilization are quite capable of grasping the iconic nature of photography and its analogic means of representation.[29] They interpret quite well the "content" of the picture, but they see it as an image constructed among others: drawing, sculpture, or painting. They spontaneously perceive the photo as intermedial

because they lack the feeling of the *arché*, which is culturally grounded, an awareness grown from exposure to the capturing-reproducing technique. The *arché* is so ingrained in us that it has become the very essence of photography, conceptualized as a singular medium. In this sense, does the Barthes of *Camera Lucida* not fall into what he criticizes in *Mythologies*—a confusion between nature and culture?

At the other end of the spectrum, photography directly poses the question of the limits of medium specificity and, likewise, that of dissemination—a flourishing in multiple and diverse "partnerships"; photography is truly a medium subordinate to several other media, from the postcard to the Internet, circulating through the press or the poster. To this proliferation of media formats are added new production or messaging possibilities, especially in the form of software such as Photoshop, not to mention the new challenges of virtual photography, or more precisely, virtual images imitating the photographic *arché*.

The Photographic Process and the Medium of Light

Overall, the evolution of photography is undoubtedly imaginable on the basis of our two original stages; on the one hand, there is the hodgepodge phase before the institution, during which a medium is engaged in a process of "discovery" through various trials and practices; on the other hand, there is the phase of relative institutional and cultural awareness proper to the second birth. But once again a feature of photography obligates us to avoid a reductive simplification of its archaeology: the richness and complexity of the changes in its "technical micro-system," which Marie-Sophie Corcy charted over an extensive period from 1839 to 1920. As Corcy remarks, the camera, "composed of different parts (the chassis, the camera obscura or body of the device, the lens, the shutter), . . . makes possible, through a rational association" of its multiple elements (no fewer than 4,228 patents in this eighty-year period) the "production of an image that we call photographic."[30]

The same goes for what Corcy aptly calls the "photographic process," which "brings together and implements knowledge, know-how and specialized techniques (such as chemical, optical, or mechanical) borrowing from various scientific and industrial spheres."[31]

Corcy's documentation research enables us to elucidate the "differential" and thus institutional birth phase in relation to our second birth, even if for photography this "emergent" phase extended over much of the nineteenth century. Her observations concern mainly the trade publication *La Lumière*, the organ of the Heliographic Society, the first photography association in France, founded in 1851 (the journal began publication that same year and ended in 1854).[32] The determined pronouncements made in a *La Lumière* editorial capture the movement toward establishing an institutional place for this new "medium of light" that photography would become. Corcy quotes Antoine Claudet, for whom the newspaper was to "exercise a

considerable influence on the work of photography."[33] For Corcy, the mission of those working on the publication was, in their eyes, of paramount importance. She thus says of the journal, referring once again to Claudet's 1851 text, that it "fostered, validated, and circulated research, in order to '[destroy] empiricism and [repel] ignorance, which is always accompanied by quackery.'"[34]

As always, the titles of journals that bring together companies or practitioners of a "new" technology are particularly revealing of the imaginary associated with this technology and the way in which the technology is defined and legitimized. Such is the case with *La Lumière* (The light), whose title most certainly does not refer to the apparatus of the new medium but is nevertheless directly linked to it through metonymy. Light is undoubtedly the end point of the quest, that which one seeks to capture. The technological device Niépce developed was entirely devoted to capturing/preserving/reproducing the impression of light. This also remains the main objective of photography, as attested in the etymology of the word: writing with light. This is what seems revealing about the first birth: that of a technological device that preserves light in order to produce a visual re-presentation of a recorded reality.

At the same time, once its inaugural feats were attained (to preserve/reproduce an impression of light), nobody well understood what purpose this new device would serve, or how it would integrate into society, cultural practices, and social uses. That would only become clear in the institutional clarifications of the second birth. This process of clarification, this effort to establish rules and a frame of reference, is well portrayed in the title of the journal *Le Bulletin de la Société française de photographie*, which began publication in 1855. Everything in the title points to "formalizing" and "institutionalizing." Not only is the term "society" used, but its nationality is specified, fixed to the name of the medium that is recognized: photography (several members of the Heliographic Society left in order to found the new society). The term *bulletin* is also highly indicative of the advent phase of the second birth. What, indeed, is a bulletin if not an official periodic organ providing information about an organization as well as a forum for its members to communicate? If there is a bulletin, it is because the institutionalization of the medium is under way.

The Double Birth in the Shadow of Cultural Series

In order to avoid a mechanical application of the double-birth model, one reduced to an inflexible grid, the perspective offered by the notion of cultural series seems indispensable. Although an intellectual abstraction in many cases, a cultural series can depend on the selection, by the researcher, of a particular point of view in order to divide the historical and phenomenological continuum under study into smaller pieces.[35] The concept of cultural series has previously enabled us to show that attributing the invention of cinema to the Lumière brothers does not hold water.[36] The concept of cultural series offers an opportunity to reshuffle the deck to show, for example, that casting Edison's

Kinetoscope into the margins of history, into the midst of that other construct passed off as fact—"precinema"—is rather outrageous! The Edison Kinetoscope, its perforated film, whose use extends until this very day, and the illusion of movement it produces, at the margins of history—really? We should not mistake chalk for cheese, even if it is the green variety found on the moon in a Méliès film! In the name of what logic and pseudohistorical truth should Edison and the Lumière brothers be segregated at all costs, in nearly incompatible worlds? Yet the Lumière brothers and Edison are easily brought under the same rubric, thanks to the "magic" of cultural series; they represent two of the cornerstones of the cultural series of animated photographs.

A cultural series can be the creation of a historian seizing on a theme, cultural practice, type of show, or type of representation more or less associated with a device or apparatus in an attempt to chart and understand the formation of a medium identity across these different transformations. If a cultural series is a construct, it is also, necessarily, a means of projecting a spotlight onto certain phenomena or aspects of a phenomenon. To define a cultural series is to place into view a "fact . . . marked by a [particular] cultural 'identity,'" as noted by a group of authors assembled around Jan Baetens: "If we try to read it as broadly and openly as possible, a cultural series would then be a certain type of action (for example, telling a story or trying to represent reality) marked by a historically recognizable cultural and medium 'identity' that can take various physical and media forms (one can tell stories through words but also supported by images and sounds, just as one can represent reality, or an aspect or part of reality, through tools either visual or verbal, analogue or digital, concrete or abstract, and so on)."[37]

One of the major challenges of using the concept of cultural series in the historiography, genealogy, or archaeology of media resides in the question of difference between cultural *series* and cultural *practices*. In this regard, it is important to remember that the concept of cultural series as originally conceived was specifically devised to overlap with a cultural practice of any kind, providing it with a diachronic dimension. It was only at a later moment that cultural series entirely devised by the historian were admitted; these could only exist from his or her particular perspective. For example, the *selfie* is certainly a cultural *practice*, but it can likewise be construed as a cultural *series* for the historian, researcher, or theorist who wishes to divide and analyze cultural reality from a selfie perspective.

With cultural practices, we can study the way a medium developed as it was subjected to particular and established cultural uses of the day. Reading the medium in terms of cultural series, on the other hand, enables us to understand what came together to constitute the uneasy equilibrium, constantly *in friction*, that defines a medium. Cultural series, precisely, are designed to traverse and go beyond fixed media and generic categories and to break free of institutional crystallizations. They find their dynamic place in extending and prolonging continuity in various forms. *Specialized studies of series* can (should) therefore focus on the "postmedial" process of the series being studied. As for the "downstream" life of the medium around which cultural

practices converge, we could also locate them "upstream" of this same medium: often, cultural practices that have become dominant are those that at one time promote or produce media crystallizations that generate a number of media.

A cultural practice, once it is established, recognized, constituted, and guaranteed by a corporate body, can often be transferred to a medium, insofar as a medium institutionalizes, around its recognized expressive singularities, a number of accepted and even valorized cultural practices. This was one of the more or less explicit functions of the trade journals mentioned above. At that point, the cultural series, and the commitment to intentional research it brings about, can illuminate a medium and the stages of its continuity.

Cultural Series and Photography

It seems quite interesting, then, to chart the way various cultural series come into contact and dialogue—but also in friction, in conflict, consistent with the dynamic described above—with one another, in order to to build an archaeology of photography. As such, a comparison between the respective networks of cinema and photography is very revealing, particularly in the nineteenth century. Thus, if we adopt a "cine-centrist" point of view, it would seem that many classical historians have tended to reduce chronophotography to a form of precinema. Similarly, several authors in the same cine-centrist vein—and thus marked by teleology—have conflated animated stereoscopic photography and chronophotography by forcing two cultural series and practices into the same preestablished paradigm, that of so-called pre-cinema.

In this regard, Caroline Chik's work on *animated photography* offers a valuable corrective. The author shows that "animated photography cannot be reduced to the naïve, outdated and incomplete category of pre-cinema, especially since it exists under various forms predating cinema, even today."[38] Situating herself in the investigative spirit of cultural series and applying a certain level of historical cine-centrism, Chik discovers that "the term 'animated photography' was not really used in nineteenth-century discourse until the early days of kinematography, with which it coexisted, therefore becoming one of its synonyms."[39] However, as she further argues, "In the twentieth century the term would become pejorative in the writings of theorists and historians of cinema, when cinema is taken as a specific art and industry." Let us note in passing that here is indeed a consequence of a medium's second birth, in this case cinema. With its push toward regulation and institutional awareness, the second birth inevitably develops a form of series-centrism. When a medium embarks on a process of institutionalization, the cultural series (or the hypercultural series) it constitutes should preferably be named in such a way as to indicate its autonomy, singularity, and identity. And, in the same gesture, competing names that recall too many other media and other cultural series should be eliminated. A medium, if it wants to be true to itself, and be taken seriously in itself, must adopt a proper name.

In this sense, the term "animated photography" is no longer appropriate because it pulls cinema into another medium's orbit, as if this other retained priority over it.

Part of Caroline Chik's research consists precisely in reclaiming the medium of "animated photography" in order, from a certain point of view, to provide it in her own way with the second birth to which it was not entitled by seeking for it identity-defining autonomous traits: "I wish to give animated photography a less negative meaning, by bringing under its name photographic forms which are themselves autonomous in relation to cinema and which depend on photography's innate capacity to animate itself on the spot, fleetingly, in ways that are specific to it."[40]

When the double-birth model is revitalized and used in the spirit of a cultural series reading, it seems to us to provide the archaeology of photography that rich complexity it deserves. It is the legitimacy of this pursuit that the preceding text hopes to have established.

Notes

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1. First publication, in French, in 2000: Gaudreault and Marion, "Un média naît toujours deux fois . . ."; English version, five years later: "A Medium Is Always Born Twice . . . " (reprinted in 2014 in Abel, *Early Cinema*, 69–83).
2. As explained in chapter 5 of our recent book (Gaudreault and Marion, *The End of Cinema?*), the use of a biological metaphor was intended to deride the hagiographic mythology that has the "infant medium" being delivered to our doorstep one fine morning by some turn-of-the-century stork.
3. See especially chapter 5 of Gaudreault and Marion, *The End of Cinema?* The present text was intended to reproduce, for an English-speaking readership, some elements of chapter 5 of the original version of the book (published in French), but the quirks of publishing are such that the English translation of the book was published first.
4. This section is largely taken from chapter 5 of Gaudreault and Marion, *The End of Cinema?*, and was originally translated by Timothy Barnard.
5. In the sense in which Roland Barthes exclaimed, "Language . . . is quite simply fascist" ("Lecture in Inauguration," 5).
6. For more information on the concept of "cultural series," see Gaudreault, *Film and Attraction*.
7. The historical development of photography is necessarily limited in the scope of this article. Moreover, it emphasizes the French side of this history in terms of context and actors. The authors are fully aware that such genealogical research should be expanded in the future to include the international context.
8. Debray, *Vie et mort de l'image*.
9. See Batchen, *Burning with Desire*.
10. André Rouillé, *La photographie en France*, 9.

11. Arago's speech is discussed in Gaucheraud, "Beaux-Arts: Nouvelle Découverte,"and "Fine Arts—The Daguerotype."
12. Gaudin, *Traité pratique de photographie*, 20.
13. Bajac, *L'image révélée*, 15.
14. Verón, "De l'image sémiologique aux discursivités," 53–54.
15. The term *monstration* refers to the enunciative act in the construction and production of a visual representation (in the selection of visual motifs, composition, and arrangement of these). For additional perspective on *monstration*, see Gaudreault, *From Plato to Lumière*.
16. Nadar qtd. in Peeters, *Les métamorphoses de Nadar*, 46.
17. Nadar qtd. in Rouillé, *La photographie en France,* 240.
18. Gunthert, "Archéologie de la 'Petite histoire de la photographie,'" para. 11.
19. Eugène Disdéri published *L'art de la photographie* in 1862. See Disdéri, *Essai sur l'art de la photographie*. With a preface by Fabrice Masanès, this book reprints a part of *L'art de la photographie*.
20. See Balbi and Natale, "The Double Birth of Wireless," 28. In this essay, the authors set out to test our hypothesis of the second birth with respect to the invention of the wireless; to do so, they use the concepts found in the Social Construction of Technology (SCOT) model.
21. Rouillé, *La photographie en France*, 7–8.
22. Benjamin, *The Arcades Project*, 678.
23. Benjamin, *Illuminations*, 189–90.
24. Barthes, *Camera Lucida*, 28.
25. Schaeffer, *L'image précaire*, 86.
26. Baudelaire, "The Modern Public and Photography," 88.
27. Ibid.
28. Schaeffer, *L'image précaire*, 86.
29. Ibid.
30. Corcy, "L'évolution des techniques photographiques de prise de vue." Corcy chose as starting point for her study the year 1839 as the moment of "the divulgation of the daguerreotype process" (57).
31. Ibid.
32. At the decisive moment when, according to Rouillé (*La photographie en France*, 8), "photography properly speaking (reproducible on paper thanks to the negative/positive system) began to rival the daguerreotype (which yielded only unique metal plates)."
33. Claudet in *La Lumière,* 1851, qtd. in Corcy, "L'évolution des techniques photographiques de prise de vue," 58.
34. Ibid.
35. We take the liberty of referring the reader to our most recent remarks on the question of cultural series: André Gaudreault and Philippe Marion, "Défense et illustration de la notion de série culturelle" (2016), English version to be published in Keil and King, *Oxford Handbook of Silent Cinema*.
36. In spite of inventing a device for recording, projecting, and processing celluloid film, neither the Lumière brothers nor their contemporaries gave the name "cinema" to the cultural practice made possible by the Cinématographe. Likewise, Edison's Kinetograph permitted the recording of film and his Kinetoscope the viewing of it. Therefore, two different inventors, from different countries, concurrently developed unique devices for the recording and viewing of film. Depending on the particular characteristics that are seen as most essential (projection, recording, the use of celluloid, etc.), a historian will typically attribute the invention of "cinema" to one of these inventors rather than the other.
37. Baetens et al., "Transformations médiatiques," 224.
38. Chik, "La photographie stéréoscopique animée," 133. We note in passing that Chik is the author of an essential book whose preface was written by one of the two authors of the present text: André Gaudreault, preface to Chik, *L'image paradoxale*.
39. Chik, "La photographie stéréoscopique animée," 134.
40. Ibid.

Afterword

Media History and History of Photography in Parallel Lines

GEOFFREY BATCHEN AND LISA GITELMAN

Written from a cross-disciplinary perspective, and having as its main subject the relationship between photography and other media, this book challenges established boundaries within which the history of photography is usually approached and disseminated. In this afterword, historian of photography Geoffrey Batchen and media historian Lisa Gitelman enter into dialogue to address the following questions: How can the study of photography contribute to an integrated history of media? And how can media history, a discipline that programmatically employs an integrated approach to different media, contribute to a better understanding of the history of photographic practices?

BATCHEN: There is a history to the history of photography, and therefore a story to be told about how that history came to be an autonomous one bounded by medium specificity. This is a story about artistic aspirations, and the struggle photographers once had in being taken seriously by the art establishment, and then about a few influential American photographers, like Alfred Stieglitz, Edward Weston, and Ansel Adams, who were advocates of an unmanipulated, "straight" photography and pushed to have that approach adopted as a historical method by Beaumont Newhall, who published the first art history of the medium in the 1930s. The approach has been consolidated by art museums, who eventually created photography collections and departments, and therefore instituted a compartmentalization of the medium, hiring curators who

specialized in the study of photographs, and publishing books and catalogues that again looked at photography in isolation from a broader history (even from a broader art history). This situation is now changing, on a number of levels. Some museums are rethinking their departmental structures, recognizing that quite a few artists have in fact worked across different media (from Louis Daguerre to Man Ray to Christian Marclay) and are therefore not being well served by the current setup. The study of photography as an academic discipline has also shifted, from an almost exclusively art-historical discourse to one scattered across many disciplines, including history, American studies, women's studies, race studies, anthropology, and so on. Scholars from these other disciplines have no interest in medium specificity, being engaged in the study of visual culture as a whole. In their work, photographs are often just one element of a thematic analysis that might also encompass literature, music, mass media, and a range of imagery of all sorts.

The gradual disintegration of an art-historical bias in the study of photography has also allowed for more in-depth studies of practitioners for too long trapped in a photographic ghetto. A recent book by Stephen Pinson about the career of Daguerre, to take but one example, looked at length at Daguerre's work as a painter and designer, arguing that his experiments toward a daguerreotype process can only be understood in this context. My own research has looked at the first two commercial studios to open in London, established by Richard Beard and Antoine Claudet in 1841. These studios mostly made daguerreotype portraits for relatively wealthy patrons, but they also sold their photographs to journals like the *Illustrated London News* to be published there as wood engravings, or they issued them as lithographs or engravings themselves. One daguerreotype portrait of the Duke of Wellington, taken by the Claudet studio on May 1, 1844, subsequently reappeared as a painting, steel engraving, stereo-daguerreotype, copy daguerreotype, stipple engraving, aquatint, hand-colored steel engraving, and carte de visite albumen print. Each reproduction has its own distinctive pictorial qualities, but each is also haunted by the first daguerreotype image, which gives that reproduction its presumed authenticity.

Photographers like these were well aware that they traded in photographic images, not just in photographs, a distinction recognized in law when copyright legislation was passed in the British Parliament in August 1862 that covered the work of photographers. In this sense, photographers entered an economy of reproductions already established by printmakers and painters and were often served by the same print sellers and booksellers who carried other kinds of imagery. For all these reasons, if they want to do justice to their subject, future histories of photography are going to have to embed their accounts in a wider media history and indeed in a larger history of industrial and consumer capitalism.

Having said all that, an argument still needs to be made for the specificity of both photography's history and its nature as a medium of representation. Despite many overlaps with other media, and a common social, cultural, and economic context, photography does have some distinctive elements. Analog photographs are printed

from a matrix, like engravings, but they can be printed in a variety of sizes and sometimes in different media (as either a salt print or an albumen print, for example). Photographs, as Roland Barthes and many others have discussed, have a peculiar relationship with their referents, and thus to referencing in general, due to the indexical means of their generation. This peculiarity matters, psychologically as well as pictorially. Photography eventually became a popular domestic craft rather than just a professional practice, and this too has distinguished its history from that of most other media forms. All these things are important to an understanding of photography's role in the development of modernity and of our relationship to photographic images. And all these things, and more, would need to be recognized in any media history that also included photography. So such a history has a complex task: to embed photography in a broader media context even while acknowledging its exceptionalism.

GITELMAN: Yes, I agree, and Geoff is gesturing as well toward the importance of media to historical epistemology—that is, the history of ways of knowing, how they develop and change. Photography, like language, has been an incredibly important *figure* in the history of knowing, part of the way we have grappled and continue to grapple with referencing and indexicality.

On media history more generally, it is difficult to pinpoint just how it happened that history came to be understood (and taught) as a parade of technological forms, even a sequence of revolutions or the triumphal successions of Western modernity: the printing press, the telegraph, the telephone, and onward to the networked PC and smartphone. Whatever the origins of this pattern, though, it is now the object of welcome and sustained critique. The easiest of the criticisms being leveled, I suppose, is that different forms of media cannot be studied—or indeed apprehended—in isolation from one another but must instead be tackled synchronically, as mutual and interdependent forms. I call this "the easiest" of criticisms (though it is by no means easy) because it can paradoxically prop up the formalist sensibility it also seeks to undermine: media forms cannot be understood separately, and yet they must be separable in order to explore the ways their histories tangle and conjoin. The parade of forms one by one becomes a parade abreast, and every entrant in the parade is plural and shape-shifting. The present volume on *Photography and Other Media* signals this same formalist sensibility in its title, and yet the essays it gathers offer together a helpful redress. Photography—like any medium—is not one thing but instead many. Not only has photography as such included an enormous variety of technical features and framing conditions, but its meanings (its uses?) have been many and multiform, culturally specific, politically mobile, historically dynamic, and radically indeterminate.

If the histories of photography have tended to receive slender attention within media studies to date—a nod to Daguerre, an anecdote about long exposure times, and passing mention of Kodak—it is likely for two reasons, or for two versions of the same reason. First, there is the age-old contest between word and image, in which language seems forever to have gained the upper hand. Second, contemporary preoccupations

with digital networks and information processing have helped to direct attention selectively toward the most obvious precursors, so telegraphy becomes the Victorian Internet, for instance. Both of these points are obvious, even banal, yet they help to suggest the enormous potential that the histories of photography still have to contribute to our understanding of media. Adding photography in all its complexity into media-historical inquiry should earn us a better, more nuanced understanding of the sociotechnical conditions of communication as well as the varied and trenchant power of images amid the prosperity of words and information.

One way the histories of photography and media history have started to work on parallel lines has to do with the issue of materiality. If recent historiographies of photography have considered photographs not merely as visual phenomena but also as material objects with their own agency and social life, works in media studies have likewise pointed to definitions of media as objects and artifacts whose materiality literally matters, making a difference to the work they do. These approaches reflect a renewed interest in the social life of things generally but also a related interest in what Kirschenbaum calls the "forensic materiality" of digital media: in other words, the discovery that even today's digital media, notwithstanding the virtuality they conjure, possess an inescapable materiality. In this context, the turn to consider nineteenth-century photographs more concertedly as things and not only as images has been enormously productive, leading to a more nuanced understanding of nineteenth-century photographic media. Certainly the page and the screen both have limited utility when it comes to the re-presentation of nineteenth-century photographs, so that seeing and even holding nineteenth-century examples is key, while dabbling with nineteenth-century photographic processes can also be instructive, not to say fun. We're stuck with the page and the screen, of course, so mobilizing them as the impoverished vehicles they are elicits a comparative sensibility, an exactingly precise vocabulary, even a forensic eye. And isn't it nice for just a moment to think about the poverty of pages and screens, since both have been the engines of proliferation, devaluing the image by supporting its ubiquity?

BATCHEN: As Lisa suggests, the perception of nineteenth-century photographs often involves touch as well as sight, and even, on occasions, smell, sound, and taste (sometimes literally, sometimes only in a conjured, virtual sense). The acknowledgment of the multisensory nature of the photographic experience has required a certain honesty on the part of scholars; it has required photographic historians to look beyond the image as an apparition (as a mere reproduction on a page or screen) and to instead engage with the photograph as an object, as a thing in the world. They have had to describe photographs as they actually are, complete with cases, frames, mats, pads, creases, textures, volumes, imperfections, inscriptions, and additions. But it has also meant having to extend that honesty of regard to other aspects of the photograph. For, if photographs are objects, they are also commodities and keepsakes, talismans and documents. To describe the materiality of a photograph is to engage equally with

that photograph's motivation, function, and social and financial value. The act of writing such a description forces you to account for how the photograph has been made, circulated, stored, viewed, and handled. Suddenly the study of photography is exponentially broadened, offering many more elements able to be compared with, or differentiated from, those pertaining to objects made using other media. Most importantly, it allows for a study of media forms that simultaneously locates them in the immaterial realm of a particular political economy and in the harsh world of materiality that attends actual objects, with attributes that are both specific and generic. All of this can only enrich our understanding and appreciation of all nineteenth-century media.

GITELMAN: Another point of intersection for our disciplines is the dialectic between continuity and rupture in media change. Within media history, this has kindled a lively and long-standing debate on the relationships between "old" and "new" media. The question in this context is how the introduction of new technologies—such as photography but also the electric telegraph in the middle decades of the nineteenth century—involved both continuity *and* rupture. Geoffrey is the best one to address this question with regard to photography, and I never tire of recommending his *Burning with Desire* to students and colleagues. I also try to maintain a pocket collection of examples I've stumbled upon since my first reading of his book that either imagine photography before the fact or somehow qualify its later existence. I'm thinking for example of a passage in Robert Montgomery Bird's "lost" novel of 1836, *Sheppard Lee: Written by Himself.* Bird (who later became an accomplished photographer) has one of his characters imagine a reflection trapped forever on the surface of a mirror. Then there's the "Statement of a Photographic Man" in the third volume of Henry Mayhew's *London Labour and London Poor*, originally published in 1851: he saves, he borrows, he sends his wife out to work two jobs until he can afford a photographic outfit. Then, even before he knows how to use his new outfit, he has a customer. Loath to let opportunity pass him by, he takes a photograph, but it comes out all black. So he tells his customer that it will come out bright once it dries, and the customer heads off "quite delighted." With practice the photographic man becomes even more adept at hoaxing. Examples like these help to add amplitude to any description of photography as among the "new media" of the past, and they can help us to encounter, well, the always-already newness of photography.

I suppose I persist in thinking that tackling the newness of old media is an interesting and productive way to do the work of media history. It is not the only way, by any means, yet attention to the dialectic between rupture and continuity certainly seems necessary to any nuanced account. That said, the work of David Edgerton (*The Shock of the Old*) and others is a good reminder that focusing on innovation as a way to understand technology is something of a trap. The play of rupture and continuity leaves little room for maintenance, repair, reuse, decay, and disposal and thus tends to occlude the afterlives of media technology, occluding in the process the experiences

of many non-Western users as well as the toll that Western modernity has taken and continues to take on the environment.

BATCHEN: Having written a book about the origins of photography, it is difficult for me to step outside that text and offer any new insights. In the late 1980s, when *Burning with Desire* was conceived, the work of Michel Foucault and Jacques Derrida seemed to offer a means of engaging in a productive way with this question of origins, especially when their work was read together. That work also engages critically with all binary oppositions, including those that would divide continuity from discontinuity and new from old. As I suggest in *Burning*, "A Foucauldian history of photography does not so much replace the idea of continuity with that of discontinuity as problematize the assumed distinction between the two. At the heart of both Foucault's method and photography's historical identity is once again this tantalizing undecidability, this play of a difference that is always differing from itself" (186). The challenge is to turn this undecidability into a viable historical method that can illuminate, rather than obfuscate, photography's place within a range of competing media forms. For reasons already outlined, photography was both new and traditional when first introduced into European culture. Certainly, its pictures were described in ways that sought to render them familiar (by, for example, comparing their tonal variations to those produced by existing engraving techniques), and the circulation of these pictures depended on established models of commerce. And yet there were also several distinctive aspects of photography that made it a peculiarly modern medium, a modernity that resulted in philosophical meditations in the twentieth century by such luminaries as Walter Benjamin and Roland Barthes of a sort not accorded to other print media. It is striking that those meditations again adopt a deconstructive mode that continually undercuts the very infrastructure established by their own narratives (as in the impossible distinction Barthes pretends to establish between studium and punctum in *Camera Lucida*). For this reason, I continue to believe that these kinds of texts offer useful models for future photographic discourse.

GITELMAN: There is no question that contemporary experiences of the pace and character of technological change have helped to make the history of technology more interesting and important as a field of study. So the history of "the book" prospers—thank goodness—amid the long shadows of its supposed demise, while we are also productively reaching the so-called end of media generally, as anything and everything gets reduced to data digitally encoded. The pitfalls of teleology are real—we risk seeing the past narrowly in terms of the present—but easily avoided. The past may suddenly seem filled with network protocols and interfaces, but any exacting account that is respectful of the historical record cannot mistake the nineteenth century for the twenty-first. Contrast is key. Nineteenth-century media interest me because they make the contingency of knowing and meaning so obvious, especially in contrast to the present day. Meanwhile the plenitude of digital networks is making the past

more accessible and its access more curious. The web is a vast and wonderful archive, forever prompting new questions of archive-ability and archive-ishness. Benjamin's angel of history rushes forward and faces back: In which direction should we look for sepia-filtered Instagrams or digitized daguerreotypes?

BATCHEN: I would certainly agree that all history is about the present, whether we like it or not. The recent changes in the materiality of the photograph have of course informed our historical perspectives, prompting scholars to, for example, recognize that photographic culture has always been global and that a disconcerting play between materiality and immateriality was always already a central feature of photography's identity. These recognitions can lead to all sorts of new reflections on aspects of photography that perhaps we thought we already knew. I have myself been prompted, for example, to look again at the history of photography in Australia, my own country of origin.

A familiar figure in that history is John William Newland, a man who opened a studio at the corner of King and George Streets in Sydney in March 1848, having arrived there from New Orleans in the United States (where he advertised his photographic skills as early as May 1845). At least one portrait made in Sydney by Newland has survived, along with a view of Murray Street in Hobart taken from his studio window in 1848, the earliest Australian view daguerreotype yet located. In both Sydney and Hobart, the English-born Newland apparently exhibited hundreds of daguerreotypes he had brought with him, taken in Europe, South America, and the Pacific (representing, he claimed in the *Sydney Morning Herald*, "the principal inhabitants of two thirds of the Globe" and including "the only correct likenesses ever taken of Pomare, Queen of Otaheite, the King, the Royal Family, Chiefs, and several other Natives, Beautiful specimens of the New Zealanders, Feejeans [*sic*], Peruvians, Chilenos, Grenadians and panoramic views of the City of Arequipa, Peru etc."). He also offered displays of projected images (using an oxyhydrogen microscope and lantern, a chromatrope, and a diorama), presumably of a similarly international scope, images that of course were consumed as apparitions composed of nothing but light. By 1850 Newland was working in India, establishing a studio in Calcutta between 1852 and 1854. So here we have a figure whose itinerancy considerably complicates any history of Australian photography based on national boundaries or essential cultural attributes. But he similarly complicates any history of photography based only on photographs (very few of his have survived, and none from his global pantheon, and a large part of his business was based on the exhibition or projection of photographic images rather than on the selling of actual photographs). What kind of historical understanding of photography do we need to invent to encompass this kind of figure and this kind of protodigital practice?

At the least, we would need to extend an argument put by the American cultural commentator Oliver Wendell Holmes in an essay, he published back in 1859, "The

Stereoscope and the Stereograph." In that essay he described photography as "the divorce of form and substance." As a consequence of photography, Holmes said,

> Form is henceforth divorced from matter. In fact, matter as a visible object is of no great use any longer, except as the mould on which form is shaped. Give us a few negatives of a thing worth seeing, taken from different points of view, and that is all we want of it. Pull it down or burn it up, if you please. . . .
>
> . . . Matter in large masses must always be fixed and dear; form is cheap and transportable. . . . Every conceivable object of Nature and Art will soon scale off its surface for us. . . .
>
> The consequence of this will soon be such an enormous collection of forms that they will have to be classified and arranged in vast libraries, as books are now.[1]

Holmes's commentary acknowledges that photography involves the separation of the image from its referent, making "form," among other things, cheaper than "matter" and therefore more easily turned into a commodity. But he also stresses the centrality of the photographic *image* to the history of photography, a stress very much in accord with today's digital economy. A study of figures like Newland and Holmes (and Beard and Claudet) might allow us to see photography as a continual process of such separations, first of form from matter and then of form from form, with the latter separation—of the photographic image from the photograph—driven above all by the demands of consumer capitalism. Doubly displaced from its origins (which it nevertheless haunts as a ubiquitous presence), crossing borders without restraint, rejected or ignored by our culture's authority figures (including, until recently, by photography's historians)—this virtual entity, the photographic image, is, in every sense, photography's *refugee*. We now need a refugee history to match it.

No longer confined to precious commodities or specific technologies, this would be a history able to address itself to the full implications of photography's *mobility*—that is, to an accounting of dynamic relationships, not just to static objects, and to a tracing of dispersals rather than a celebration of origins. Breaking with the self-imposed ghetto of medium purity, photography's history would at last engage the photographic image in all its various manifestations, wherever and in whatever form they have appeared. As a consequence, the dissemination of the photograph, rather than its production, would become this history's primary focus and guiding logic. Perhaps the most significant consequence of this new kind of history is its necessarily critical engagement with the identity of its purported subjects. For, as Derrida has discussed at length, dissemination both divides and multiplies whatever it conveys, complicating, for example, our grasp of both "photography" and "history." At every level, then, there are exciting times ahead for the creative practice of photographic history.

Note

1. Holmes, "The Stereoscope and the Stereograph," 747–48.

Bibliography

Abbreviations

AJP *American Journal of Photography*
HJ *Humphrey's Journal*
PAJ *Photographic Art-Journal*
PFAJ *Photographic and Fine Art Journal*
PP *Philadelphia Photographer*

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